This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

**Usage guidelines**

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

**About Google Book Search**

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

NYPL RESEARCH LIBRARIES
3 3433 06924183 8

Comly
RNTF

Public school
no 8. Dist no 3
Book 11

Comly
TRNPF
564.E

# COMLY'S READER,

AND

# BOOK OF KNOWLEDGE;

WITH EXERCISES OF

## SPELLING AND DEFINING,

INTENDED

For the Use of Schools,

AND FOR PRIVATE INSTRUCTION.

BY JOHN COMLY

OR LIBRARY
EW-YORK.

PHILADELPHIA:
THOMAS L. BONSAL, 33½ MARKET ST,

1849.

ENTERED according to Act of Congress, in the year 1845, by
THOMAS L. BONSAL,
in the Clerk's Office of the District Court of the Eastern District of Pennsylvania.

# PREFACE.

It has long been an opinion of the author of the following lessons, that while children are learning the art of reading, they might as well be acquiring a knowledge of things;—things that will be useful to them in after-life.

Although much advancement has been made in the improvement of school-books and others for the use of children and young people, yet the object of furnishing them with a familiar knowledge of natural things, interspersed with moral lessons, in a series of reading exercises, appears to have been too much neglected.

It was a wise observation of William Penn, that "the first thing obvious to children, is, what is sensible." Again, he says, "We press their memory too soon, and load them with words and rules that may never be useful to them; leaving their genius to natural knowledge uncultivated and neglected;—which would be of great use and pleasuse to them through the whole course of their lives."

"It is pity, therefore," says he, "that books have not been composed for youth, to be read in schools, by which they might learn *things* with *words*;—things obvious and familiar to them."

In accordance with these views, the author and compiler of the nsuing work has endeavoured to present the young reader with variety of subjects that may be obvious to his senses;—emracing a knowledge of things natural and artificial, and rendered a style and language adapted to his capacity and undernding.

Cowper says "Variety's the spice of life;" and the intermixe of subjects, natural, moral, scientific and historical, may furnish a relish and stimulus even to children in their reading lessons.

Care has been exercised to avoid many difficult and technical words and phrases; and also to give the descriptions of subjects in plain, simple language, suitable for children who are just rising from the spelling book to a higher class.

It will therefore be understood that this work is intended to follow the author's Spelling and Reading Book, lately published by Thomas L. Bonsal.

Yet, that the important object of *correct orthography* may be kept steadily in view, as an essential to correct reading,—the more difficult words in each lesson are selected and placed at the bottom of the page, as an exercise of spelling and occasional defining, after each lesson has been read. The defining of words may be increased, at the option of the teacher, especially with children reading in classes.

The exercise of spelling and defining the words, forms a prominent object of children's "getting their lessons," so as to be able to spell out of book every word contained in them; and also, by the help of a Dictionary, to give their definitions.

Questions to exercise the pupils in the knowledge of *things*, or subjects contained in the ensuing Reading lessons, are added in an appendix. In the list of Promiscuous Questions, children may amuse one another by selecting and giving out interrogations for each other to answer.

In making out the following work, numerous authors have been consulted, and various sources of information carefully searched. With due acknowledgment to preceding writers and compilers, the author dedicates this to the rising youth, and to the patrons of rational and useful education.

JOHN COMLY.

*Byberry, 2d mo. 1st., 1845.*

# CONTENTS.

Page

Sentences and Paragraphs.......... 5

Psalms of David.......... 20

Brief History of Joseph and his Brethren.......... 21

The Country.......... 26

Avoid anger; live in harmony.......... 27

Mirrors.......... 28

About Fishes.......... 29

Variety.......... 30

On habits of Attention and Reflection.......... 31

Divine Providence.......... 33

Evening Reflections.......... 35

Breakfast.......... 36

Salt.......... 39

Pottery—Earthenware—Porcelain.......... 40

My Mother.......... 43

The Frog, or Toad.......... 44

Agriculture.......... 47

Spices.......... 50

About Ourselves.......... 52

Of Metals.......... 54

Iron.......... 57

Home.......... 59

Early Settlements of Pennsylvania.......... 62

Natural History.......... 64

The Bat.......... 65

Flax.......... 66

Page
Cotton........ 68
Hemp........ 69
Camphor, &c........ 70
Opium........ 71
The Night-hawk........ 72
The Prism Glass and Colours........ 73
Love Truth. Abhor Lying........ 75
Sculpture........ 76
Ruminating Animals........ 77
Hats........ 78
The Deer........ 80
Address to a Wild Deer........ 83
Gratitude........ 85
Miscellaneous Subjects........ 86
Reading, Speaking, and Writing should be clear and distinct 88
Glass........ 90
Geography........ 92
Dialogue between a Mother and her Child........ 94
Good Neighbours........ 95
Indigo, &c........ 96
Why the Sun appears larger at sunrise and sunset........ 97
Short Account of William Penn........ 99
Process of making Pins........ 101
On Peace and War........ 104
Description of a Copper-mine, in England........ 107
The Seal........ 110
Balloon........ 113
Narrative of a vain Youth........ 115
The Eye........ 119
Latitude, Longitude, Length of Days, &c........ 121
Botany........ 124
Libraries........ 126
Process of making Paper........ 127
Description of a Volcano........ 130
Corks—Gum-elastic—Castings........ 124

Page
The Hare and Rabbit........................................ 136
Drugs........................................ 142
The Polar Bear........................................ 144
Rail-roads........................................ 145
Franklin's Whistle........................................ 146
The Moon........................................ 148
Friendship........................................ 150
Receipts—Book-keeping........................................ 151
Economy and Frugality........................................ 152
Pleasing Comparisons........................................ 154
A Psalm of David........................................ 155
Tenderness to Animals........................................ 158
Gases........................................ 159
A patient, peaceable Temper and Conduct recommended.... 161
Look through nature up to nature's God........................................ 163
Mules—Anecdote........................................ 165
Astronomy........................................ 169
The Planets........................................ 170
The Good Samaritan........................................ 174
The Telescope and Microscope........................................ 177
Transformation of Insects........................................ 180
Natural History of Bees........................................ 183
Steam Engine........................................ 190
Counsel to Youth........................................ 193

## APPENDIX.

Questions for Exercise........................................ 197
Promiscuous Questions........................................ 211

# COMLY'S READER.

## *SENTENCES AND PARAGRAPHS.*

### LESSON I.

The path of virtue is the path of peace.

To be good, is the way to become happy.

A peaceful mind is a hidden treasure.

The sum of seven and nine is sixteen.

The earth turns round on its axis in twenty-four hours.

Silence is a useful lesson for children to learn.

The product of four times six is twenty-four.

Glass is made of sand and an alkaline salt, melted together.

We should be kind to all persons, even to those who are not kind to us.

The moon goes round the earth, in about twenty-nine days and a half.

For every idle word that we speak, we shall have to give account in the day of judgment.

### LESSON II.

We should be sincere in all we say or do, and never depart from the truth.

An acre of ground contains one hundred and sixty square perches.

---

**Exercise after Reading.** Spell virtue; treasure; axis; twenty; alkaline; peaceful useful; idle; judgment; account; together.

Sixty seconds make a minute; and sixty minutes make an hour.

Sound flies at the rate of eleven hundred and forty-two feet, in a second of time.

To be easy in living, is much of the comfort of life; but restless tempers will often want it.

In reading, be careful to speak neither too fast nor too slow.

When we speak or read to another person, we should always raise our voice so as to be heard distinctly.

The moon is said to be two hundred and forty thousand miles from the earth.

Pursue that course of life which is best, and custom will render it most pleasant.

## LESSON III.

The product of nine times twelve is one hundred and eight.

It is dangerous for children to play, either with sharp edge-tools, with fire, or with gunpowder.

A quiet state of mind, like other good things, is more easily lost than gained.

The sun is ninety-five millions of miles from the earth.

An eclipse of the sun, is when the moon passes between the earth and that body. This can only happen at the time of new moon.

When the moon is eclipsed, it is because the shadow of the earth falls on it; and this can happen only when it is full moon.

---

Lesson II. Spell sincere; acre; restless; perches; minute; second; should; distinctly; thousand; pursue; course; another; thousand, pleasant. How many perches make an acre of ground?

Lesson III. Spell dangerous; either; quit; easily; millions; eclipse; between; barley; shadow. How far is the sun from the earth?

It is said, more people in the world are clothed with cotton, than with any other substance.

Barley and oats are called spring-grain, because they are mostly sowed in the spring.

## LESSON IV.

OUR best friends are often those who tell us of our faults, and show us how to correct them.

It is a good rule, in learning to read, to pronounce the words slowly, distinctly, and with a natural tone of the voice.

Passion is a sort of fever of the mind, that always leaves us weaker than it found us.

The rays of the sun's light, when reflected from the drops of falling rain, form the rainbow. Hence, the rainbow is always seen opposite to the sun.

The seven colours of the rainbow, are red, orange, yellow, green, blue, indigo, and violet.

There are seldom more than a thousand stars visible to the naked eye, at any one time.

The fixed stars are so called, because they always appear to be the same distance from one another.

Excess in apparel is a very costly folly. The trimmings of the clothing used by the vain world, it is said, would clothe the naked one.

When we confess our errors and faults, and are sorry for them, generous and good people will pity and forgive us.

---

LESSON IV. Spell learning; pronounce; distinctly; voice; passion; rainbow; yellow; violet; apparel; excess; reflected; opposite; indigo; faults; generous: orange. How many colours in the rainbow? How many stars may be seen at a time? Name the colours of the rainbow

## LESSON V.

Barley and oats are sowed early in the spring: in three or four months, the crop is grown, so as to be ready for harvest.

Wheat and rye are sometimes called winter-grain, because they are sown in the fall, or autumn, and remain in the field during the cold frosts of winter. About the middle of summer, in this climate, the crops are ripe, and are then ready to be cut and gathered into barns, or stacks.

The flesh of sheep is called mutton; that of a calf, is called veal; and that of deer, venison. Beef is the flesh of animals of the cow-kind.

We should never sport with pain and distress in any of our amusements, nor treat even the meanest worm or insect with wanton cruelty.

To do justly, to love mercy, and to walk humbly with God, contains the substance of morality and religion.

Solomon said, Fear God,and keep his commandments; for this is the whole duty of man.

## LESSON VI.

A fluid is a body or substance, composed of very small particles, which flow, or are easily moved and mix one with another; such as water, air, and other things.

Common air is about nine hundred times lighter than water.

We must learn to observe and reflect, and remember things, in order to gain useful knowledge.

---

Lesson V. Spell barley; ready; wheat; autumn; field; rye; venison; substance; animals; wanton; commandments; oats; climate; morality; insect; cruelty; amusements. Give the definition of amusements; animals; cruelty; mercy; harvest; climate.

Lesson VI. Spell fluid; easily; knowledge; parchment; solid; surface. Define surface. How many times lighter is common air

A solid body or substance, is that which is firm, hard, and compact; as wood, stones, metals.

The earth on which we live is called a solid body, when taken as a whole; yet it is composed of solid and fluid parts; such as rocks, earth, and water.

Parchment is made of the skins of sheep or goats. After the wool or hair is taken off, the skins are soaked in lime-water. They are then pared or scraped very thin, and the surface or outside is rubbed smooth with pumice-stone, so as to prepare them for being written upon with pen and ink.

He that is slow to anger is better than the mighty man; and he that ruleth his own spirit is greater than he that taketh a city.

## LESSON VII.

A GLOBE is a solid body, which is round like a ball; having every part of its surface equally distant from a point in the middle, called a centre.

The surface of any thing is the outside of it, or that part which is visible to the sight or touch.

The earth is a globe; the sun, moon, and planets, are all globes, or solid round bodies.

The diameter or axis of a globe, is a line passing through the middle of it, from one side to the opposite side of it.

The diameter of the earth is computed to be about eight thousand miles; and its circumference, or a line that would reach all round it, is about twenty-five thousand miles.

Yet this vast ball of earth turns round on its axis every twenty-four hours, which makes one day.

---

than water. Spell metals; written; mighty; greater; compact. Define compact.

LESSON VII. Spell surface. What is a surface? Spell centre. Define it. Spell visible. What is the meaning of visible? Spell diameter; axis; opposite; circumference. Define them. How many miles is the diameter of the earth? Its circumference? Spell knowledge, entreated, &c.

The knowledge of natural things may expand the mind; but heavenly wisdom is pure, peaceable, gentle, and easy to be entreated, full of mercy and of good fruits.

King David says, "Mark the perfect man, and behold the upright, for the end of that man is peace."

## LESSON VIII.

Twilight is that portion of time which passes between day-break and sun-rise; or, between sun-set and dark. In the evening, it is sometimes called dusk.

The earth has a two-fold motion: it turns round on its own axis every day, from west to east; and it moves round the sun in three hundred and sixty-five days and a quarter, which makes a year.

Although the sun is ninety-five millions of miles from the earth, yet its light passes through that vast distance, in about eight minutes.

Hence, the velocity of the rays, or particles of light, is found to be about eleven millions seven hundred thousand miles in a minute.

Who can contemplate the amazing swiftness of light, without reverence towards that Almighty power and goodness, who in the beginning of creation said, Let there be light; and there was light.

Then appeared the sea, and the dry land; the mountains and hills were formed; and the streams and rivers flowed. The sun, moon, and stars appeared in the sky. Herbs, plants, flowers, and trees grew out of the ground. Birds,

---

Lesson VIII. Spell twilight. What is twilight? Spell portion; between; evening; motion; axis. Define axis. Spell millions; minutes; velocity. What is the definition of velocity? How long does it take light to come from the sun to the earth? Spell contemplate. Define it. Spell amazing; reverence; beginning; swiftness; appeared; herbs; insects; image; obedience; mountains hereafter.

beasts, fishes, and insects, were formed by the wisdom and power of the great Creator. At last, man was made in the image of God; as the noblest part of his works in this lower world. He was made to glorify his Maker, by living in obedience to his holy will and law, that he might be happy here and hereafter.

## LESSON IX.

BY observing the faults of others, prudent persons learn to avoid them, and also to correct their own.

When it is light, we call it day; and when it is dark, we say it is night: but it takes day and night together to make a solar day; or the time during which the earth turns once round on its axis.

So we say, twenty-four hours make one day;—that is, a solar day begins at midnight, and is reckoned from that time till the next midnight, twenty-four hours.

In almanacs, the twelve hours from midnight to noon, are called morning; and from noon till midnight, the twelve hours are called afternoon, or evening.

Metals may be defined as simple, heavy, shining bodies of matter, that become melted by heat, and that harden with cold. Metals, in an impure or imperfect state,—that is, when mixed with earth and other things, are called ores. A mine is a place, mostly in the bowels of the earth, where ores are found.

A century contains one hundred years. Thus, we reckon eighteen centuries from the birth of Christ, and are now in the nineteenth—1844.

Clocks and watches to measure time, were not invented

---

LESSON IX. Spell observing; axis; midnight; hours; almanacs; metals; bodies; imperfect; century. How many years make a century? Spell hours. How many minutes in an hour? Spell eighteen, watches; measure; invented. Define invented. Spell period; value mortal; surely; human.

till about the thirteenth century. Before that period, the hour-glass and sun-dial were used to measure, or tell the time of day.

Time, once passed, never returns. While we have it, we ought to value and make a proper use of it; since the moment that is lost, is lost for ever.

All mortal men that live,
Must surely die;
But how or when, is hid
From human eye.

## LESSON X.

A WIGWAM is the house, or dwelling-place of an Indian. It is often made of posts, stakes, or slabs, set in the ground and covered with bark, with a hole in the middle of the roof to let out the smoke.

Pine-apples do not grow on pine trees; but are so called, because they are, in shape, like the cones that contain the seeds of the pine tree. Pine-apples grow on a single stem, which rises in the middle of a tuft of green leaves near the root of the plant. They are cultivated in the West Indies, and are esteemed for the richness of their flavour.

A factory is properly a house or place where traders reside, or where they meet to transact business. A manufactory is a building or place where things are made or formed by art and labour: such as cotton goods, broad-cloths, iron-ware, porcelain, glass, &c.

It is about four hundred years since printing was invented. Before that time, books were very scarce and very dear; because they were all written by hand, they were therefore

---

LESSON X. Spell wigwam. What is a wigwam? Spell dwelling; Indian; pine-apple; cultivated. Define cultivated. Spell esteemed; flavour. Define flavour. Spell factory; transact; business. What is a factory? Spell manufactory; building; broadcloth; porcelain.

very few in number, compared with what they now are. Learn from this, to value your books, to use them with proper care, and keep them neat and clean.

The sun, with all its attendant planets, is but a very little part of the great universe of creation. Every star, though, by reason of its vast distance from us, it appears to us so small, is yet really a large globe, like the sun in size and glorious brightness. Around every star, as the sun and centre of its system, there may be planets with their moons revolving, and receiving their light from its beams.

## LESSON XI.

The natural magnet, or loadstone, is a hard mineral body, and is found to be an ore of iron.

A kind word, nay, even a kind look, may often afford comfort to the afflicted.

Pure air is needful to the full enjoyment of health.

There are reckoned to be forty thousand species of insects. Every part of the world is said to be peopled with living creatures of various kinds.

Gum arabic is a gum that exudes from a small tree which grows in the deserts of Arabia.

Take not, in sport, that life you cannot give;
For all things have an equal right to live.

He that always speaks the truth, will be believed; but he that is guilty of telling falsehoods, will often not be believed, even when he speaks the truth.

It is said, one half the people of Asia live upon rice; and

---

Define those words. Spell invented, and define it. Spell and define attendant; universe; system; centre.

Lesson XI. Spell natural; magnet; loadstone; mineral; afflicted. Define afflicted. Spell enjoyment; reckoned; species; creatures; various; exudes. What is the meaning of exudes? of various? Spell guilty; falsehoods; believed; nervous; system; library. What is a it is almost the only food for men, women, and children, in many parts of Africa.

The names of the four quarters of the world, are Europe, Asia, Africa, and America.

The nervous system is composed of the brain, the spinal marrow, and the nerves.

A library is a collection of books for people to read. They are kept in a place where they may be taken out one or two at a time; and when read, they are returned to the same place for others to read. The person who takes care of them, is called the librarian.

## LESSON XII.

Light flows from the sun to the earth, at the rate of about two hundred thousand miles in a second of time. How amazingly swift is the motion of the particles of light!

That branch of science which treats of and explains the nature and properties of light, is called Optics.

Thunder is the noise produced by the rapid motion of the lightning which precedes it. The long rumbling of thunder is occasioned by its echo from cloud to cloud, called the reverberation of sound.

As sound flies at the rate of eleven hundred and forty-two feet, or nearly a quarter of a mile, in a second of time, so we may reckon whether the lightning is very near us, or at a great distance.

When the lightning and thunder are in quick succession, the flash is very near, or over our heads. But when there is a longer space of time between the flash and the report, it indicates that it is farther off.

---

library? Spell librarian; nerves; people; women; Asia. What are the names of the four quarters of the world?

Lesson XII. Spell light; thousand; amazingly; particles; science; explains; properties; lightning; precedes; define it. Rumbling, occasioned; echo; reverberation; reckon; succession; indicates

Carnivorous animals are such as feed on the flesh of other animals.

Carnivorous beasts and birds of prey attack and seize other animals by their great strength, and the armour of teeth, or of claws with sharp nails, with which they are furnished.

The windpipe in our necks is composed of circular gristly rings, which are held together by a thin elastic cover, called a membrane.

Near the entrance of the windpipe into the mouth, is a little lid or muscle, which opens to let the air pass and repass from the windpipe, when we speak or breathe. This opens more or less to modify and multiply the tones of the voice. There is also a lid which closes when we swallow, in order to keep out the food or drink which must pass over it, in its way to the stomach.

## LESSON XIII.

THE solid joys of human kind,
Are those which flow from peace of mind.

With candour, let us own our errors past,
And make each day a critic on the last.

When the buds begin to swell,
  And the blue-bird's note to flow,
The yellow violet's modest bell
  Peeps from the leaves and earth below.

'Tis greatly wise to talk with our past hours,
And ask them what report they bore to heaven.

Knowledge and wisdom, far from being one,
Have oft-times no connection. Knowledge dwells
In heads replete with thoughts of other men,
Wisdom, in minds attentive to their own.

---

define it. Carnivorous; prey; seize; strength; armour; furnished, windpipe; circular; gristly; elastic; define it. Membrane; entrance; modify; multiply; voice; swallow; stomach.

At night before I close my eyes,
And in the morning when I rise,
I pray for safety, health, and grace,
And still the Lord before me place.

Virtue, or purpos'd virtue, still be thine.
If nothing more than purpose in thy power,
Thy purpose firm is equal to the deed.
Who does the best his circumstance allows,
Does well,—acts nobly,—angels do no more.

## LESSON XIV.

When gifts, or benefits, or acts of kindness, are conferred on others, and are accepted as such, there is a mutual love felt between the giver and the receiver.

The feeling of love and gratitude is a pleasant sensation, and it expands the heart of the receiver in love to the benefactor, attended with a desire to make some return for the favour.

The exercise of gratitude for gifts and benefits received, is amiable and endearing, when it flows from man to his fellow man, and it promotes happiness and peace in the human family. But as our lives, our health, and all the blessings we receive, are conferred on us by our bountiful Creator, the feeling of love and gratitude to him is an important part of that spiritual worship which we all owe to the Supreme Being.

The perfect wisdom of the great Author of nature becomes more clearly evident to us, as we observe the various situations in which he has placed his creatures, and the modes of life for which they seem to be intended.

Of a summer evening, when the gray and dusky twilight

---

Lesson XIV. Spell benefits; conferred; accepted; mutual; between; received; gladness; gratitude; pleasant; benefactor; favour; exercise; amiable; endearing; health; receive; bountiful; important; spiritual; Supreme; evident; situations; creatures; twilight; radiant;

succeeds the departed glories of the radiant sun, myriads of insects that are warmed into life and activity by his heat, take wing and flutter in the air.

The bats which have hid themselves during the glare of day-light, now rush forth from their dark recesses, or the gloomy vaults of time-worn walls and ruins; and, with rapid flight, glut their appetites on these innumerable insects, which they seize with open mouth while on the wing. Their large ears catch every hum made by the wings of their insect prey, while they themselves fly through the gloom without noise, and gather a plentiful meal by the destruction of vast numbers of these nocturnal insects.

## LESSON XV.

In many large cities, the houses are built mostly of bricks, and the roofs covered with shingles. In villages and country places, the walls are sometimes built of stones, and the roofs shingled. Where timber is plentiful, the houses and barns are built of wood: when the timber is sawed into square pieces at a saw-mill, it is called scantling. The houses built of sawed or hewed timber, are called frame houses, and are covered with boards on the outside, called weather-boards. Another kind of houses in newly settled countries, is built of logs, and called log houses or cabins, which are often covered with bark.

A thermometer consists of a glass tube fixed to a plate of metal. This plate next to the tube is divided into degrees, and numbered from 0 to 212. The glass tube has a bulb or ball at the lower end, which is filled with quicksilver. This fluid metal expands with heat, by which it rises in the tube;

---

myriads; warmed; activity; themselves; their; recesses; vaults; rapid; appetites; innumerable; seize; catch; prey; themselves; plentiful; nocturnal. Define.

Lesson XV. Spell cities; built; covered; shingles; countries; thermometer; metal; quicksilver; descend; temperature. What is a thermometer? What is the use of a thermometer? Spell always:

and contracts with cold, which causes it to descend. The scale of degrees on the plate shows the changes of the temperature of the air; that is, the increase or decrease of heat or cold.

Some people speak with their mouths almost shut, and mutter, or speak so low that they cannot be easily heard or understood. Some always speak very loud, as if they were talking to deaf persons. Such habits are improper, and may be avoided with care and attention. We should learn to speak distinctly, so as to be readily understood by others.

## LESSON XVI.

THE Indians bring up their children with great care and strictness, in the habit of speaking the truth on all occasions. If an Indian of their tribe should ever be detected in a falsehood, he can rarely or never regain their confidence. Even though he should be the messenger of important news, he is treated with distrust; and they say, "May be so true—may be so not. He once told a lie."

John Barker, a little boy of fourteen years of age, when sick on his death-bed, gave this advice to his brothers and sisters: "You all know what is right. Do as well as you know how. All that is required of you is, to do as well as you know. Do not keep bad company; do not play with bad boys. Instead of playing in the streets, be at home reading your books."

The boundary line between Pennsylvania and Maryland, was, for a long time, a subject of dispute between the two colonies. At length, in the year 1765, the British government sent over two surveyors, whose names were Mason and

---

easily; avoided; attention; distinctly; readily. Define distinctly. Define thermometer? What is a tube?

LESSON XVI. Spell Indians; strictness; occasions; should; falsehood. What is a falsehood? Spell messenger; fourteen; company; instead; boundary. Define boundary. Spell Maryland; colonies government; Pennsylvania; provinces.

Dixon, to determine and settle this disputed line. During the spring and summer of this year, they surveyed the line in dispute, and set stones as boundary marks between the two provinces, now called states. This is what is called Mason and Dixon's line.

## LESSON XVII.

A CANDID person is one that is fair, open, just, and sincere in all he says and does. He is not hasty to judge others, and he requires full evidence before he will condemn or censure another. He views men and their conduct with charity and good nature, and never imputes an action to the worst motives. He looks on the best side of things, and is therefore much more happy in himself, than those who are always finding fault, and viewing the worst features of human life and manners.

When we contemplate the close of human life; when we consider the termination of the labours, the plans, and the devices of man; when we reflect on the silence that now reigns among those who are laid in the grave—who can avoid being touched with sensations at once awful and tender? What heart but then thinks of its own mortality? In whose eye does not the tear gather, when considering the end of passing and short-lived man?

There is a pure Divine principle placed in the human mind, which, in different places and ages, hath had different names. It proceeds from God, and is his gift to mankind. It shows us what is good and right; it is confined to no forms of religion, nor excluded from any, where the heart stands in perfect sincerity. In every one who takes heed to this principle, and obeys its manifestations, it takes root,

---

LESSON XVII. Spell sincere; evidence; condemn; censure; worst; fault; viewing; features; contemplate; termination; devices. Define it. Spell reigns; touched; sensations; mortality; eye; short-lived; principle; religion; excluded; define it. Spell sincerity; manifestations; brethren.

and grows, and brings forth the good fruits of love, justice, mercy, and peace. In all nations, and in all conditions of mankind, those who live in obedience to this pure principle of goodness, become brethren in the best sense of the word.

## PSALMS OF DAVID.

Blessed is the man that walketh not in the counsel of the ungodly, nor standeth in the way of sinners, nor sitteth in the seat of the scornful: but his delight is in the law of the Lord; and in his law doth he meditate day and night.

And he shall be like a tree planted by the rivers of water, that bringeth forth his fruit in its season: his leaf also shall not wither; and whatsoever he doeth shall prosper.

The ungodly are not so; but are like the chaff which the wind driveth away. Therefore the ungodly shall not stand in the judgment, nor sinners in the congregation of the righteous.

For the Lord knoweth the way of the righteous; but the way of the ungodly shall perish.

Come, ye children, hearken unto me: I will teach you the fear of the Lord.

What man is he that desireth life, and loveth many days, that he may see good?

Keep thy tongue from evil, and thy lips from speaking guile. Depart from evil, and do good: seek peace, and pursue it.

The eyes of the Lord are upon the righteous, and his ears are open to their cry.

---

Spell blessed; walketh; ungodly; standeth; scornful; meditate; planted; bringeth; whatsoever; doeth; chaff; wither; judgment; congregation; righteous; knoweth; perish; hearken; desireth; tongue; guile; pursue; children; eyes; righteous.

## BRIEF HISTORY OF JOSEPH AND HIS BRETHREN.

A GREAT while ago, there lived a man named Jacob, and he had twelve sons. He had also very many cattle, sheep, goats, and other useful animals.

And Jacob dwelt in the land wherein his father Isaac was a stranger, even in the land of Canaan.

Now Jacob loved his son Joseph more than all his children; not only because he was the son of his old age, but because he was a good boy, and did what his father told him. So he made him a coat of many colours, as a token of his affection towards him.

But Joseph's brothers were not such dutiful sons. And when they saw that their father loved him more than the rest of his children, they envied Joseph, and hated him so as not to speak kindly to him.

---

SPELL history; Joseph; brethren; twelve; animals; stranger; colours; affection; envied; feeding; country; whether; towards; conspired; define it. Spell stripped; wilderness; coat; company; balm

And it came to pass, as they were feeding and attending to the flocks of sheep and cattle in a part of the country at some distance from home, that Jacob sent his son Joseph to see whether it was well with his brothers, and with the flocks.

But when his envious and wicked brethren saw Joseph coming towards them, even before he was near them, they conspired against him to slay him.

And when he came to them, they stripped him of his coat of many colours, and cast him into a pit or deep hole that had been dug in the wilderness, like a well.

Then there came along a company of traders, with balm, and spices, and myrrh, going to carry them down into Egypt.

So those wicked brothers lifted up Joseph out of the pit, and sold him to these merchant-men for twenty pieces of silver: and they took Joseph down into Egypt, and sold him to an officer of the king of that country.

To add to their wickedness, and to deceive their aged father, these cruel brothers killed a kid of the goats, and dipped Joseph's coat of many colours in the blood. They then sent the bloody coat to Jacob their father, with a message that they had so found it all bloody and torn.

And Jacob knew the coat, and concluded that some evil wild beast had killed Joseph and devoured him. And Jacob said, Joseph is without doubt rent in pieces: and he mourned for him many days.

* * *

But the Lord was with Joseph, though sold as a servant in Egypt: and he became a prosperous man in the house of his master; for he was honest and faithful in all things, and he was made a steward or overseer of all his master's goods.

---

myrrh; Egypt; merchant-men; pieces; officer; deceive; bloody; message; knew; pieces; mourned; prosperous; honest; steward

Such was the confidence of his master in Joseph's integrity and uprightness, that he intrusted all he had in Joseph's hands; and the blessing of the Lord was upon all his business, both in the house and in the field; and the Lord made all that he did to prosper.

At length, however, it came to pass, that on a false charge of his mistress, his master became angry with him, and put him in prison; although Joseph was entirely innocent of the wicked charge made against him.

But the Lord whom he loved, and whom he served, was with him in the prison, and showed him mercy, and gave him favour in the sight of the keeper of the prison: so that he put all the prisoners under Joseph's care; and all that Joseph did, even in the prison, the Lord made it to prosper.

After some time, even two years, the king of Egypt had dreams which seemed to presage some great event, but none of his wise men nor priests could explain them to him. And they sent for Joseph out of the prison, in order that he might interpret the king's dreams, as he had done for two of the prisoners.

So the king told his dreams to Joseph. And Joseph explained the meaning of them, and told the king that there would first be seven years of great plenty through all the land of Egypt, and then there would be seven years of great dearth and famine in the land.

Joseph also advised the king to lay up stores of grain and corn for food, during the seven plenteous years, so that the people might not perish for want during the seven years of famine. And the king appointed Joseph to attend to this business, and to be ruler over his house, and over all the land of Egypt.

---

overseer; integrity; uprightness; business; field; however; mistress; entirely; innocent; prisoners; dreams; presage; define it. Spell explain; interpret; death; famine; plenteous; business; cities;

And Joseph gathered corn as the sand of the sea, very much; and he laid it up in store for food, in the cities of Egypt.

---

After the seven years of plenteousness were ended, the seven years of dearth and famine came, as Joseph had predicted. The famine was also in the land of Canaan where Jacob dwelt.

And when Jacob had heard that there was corn in Egypt, he sent most of his sons down into Egypt to buy corn for the support of himself and his household.

When they came unto Joseph, who was now the governor of all the land of Egypt, they bowed down themselves before him to the earth. And Joseph knew his brethren, but they knew not him; for he spoke to them by an interpreter.

Here his brothers were brought into trouble and difficulty, and then they remembered their envy and cruelty towards Joseph. In their feelings of remorse, they said one unto another, "We are verily guilty concerning our brother, in that we saw the anguish of his soul, when he besought us, and we would not hear; therefore is this distress come upon us."

Joseph, however, after taking measures to bring them to their feelings, generously gave them corn for the supply of their wants, and they returned to Jacob, their father, in the land of Canaan.

But when they had eaten up the corn which they had brought out of the land of Egypt, their father said unto them, "Go again, and buy us a little food."

So, after much hesitation, they went down again into

---

**plenteousness; predicted; household; governor; themselves; knew; interpreter; trouble; difficulty; remembered; cruelty; anguish; guilty; besought; measures; generously; Canaan; buy; hesitation; brought;**

Egypt to buy corn, and stood before Joseph. Here again they were brought into great trouble and distress. But when they were properly humbled, Joseph made himself known unto them.

After he had ordered every other person out of the room, Joseph wept aloud, and he said, "I am Joseph. Doth my father yet live?" And he called his brethren to come near him, and said, "I am Joseph your brother, whom ye sold into Egypt." And his brethren could not answer him.

Joseph then sent large provisions, with this message to his father, "Thus saith thy son Joseph: God hath made me lord of all Egypt. Come down unto me, tarry not; and I will nourish thee and thy household."

And when his brethren returned unto Jacob their father, and told him that Joseph was alive, and was governor over all the land of Egypt, he at first could not believe them. But when he saw the wagons that Joseph had sent to carry him down to Egypt, Jacob said, "It is enough. Joseph my son is yet alive. I will go and see him before I die."

And Jacob went down into Egypt, with all his household, and his flocks and his herds. And Joseph went to meet him, and embraced him. After this Jacob lived seventeen years in Egypt, and died at the age of one hundred and forty-seven years.

Some other very interesting circumstances that occurred between Joseph and his brethren, after the death of their father, are recorded in the last chapter of the Book of Genesis. These, together with the narratives contained in the preceding chapters, are worthy the careful perusal of all;

---

**trouble; property; humbled; known; brethren; answer; provisions; message; nourish; governor; herds; embraced; seventeen; interesting; circumstances; occurred; chapter; Genesis; narratives; preceding; perusal; define it. Spell portrayed; define it. Spell excellent; amiable; character; varied; condition.**

for in these are portrayed the excellent and amiable character of Joseph, in every varied condition of his life.

## THE COUNTRY.

THE poet William Cowper says, "God made the country, man made the town."

William Penn remarks, "A country life is to be preferred: for there we see the works of God; but in cities little else but the works of men."

To minds that have a relish for the study and observation of the works of nature, which are the works of God, a country life furnishes innumerable objects of pleasure and instruction.

In the fields and woods, in the waters and running streams, there are to be found a great many subjects of innocent and rational amusement, as well as knowledge that is nowhere else to be obtained.

The perfect wisdom and goodness of the great Author of nature becomes more clearly evident to us, as we "look through nature up to nature's God."

A person who walks in the fields, or strolls along the banks of a stream of water, or roams through the forest,—if he understands the elements of natural history, may read a pleasant story, and gain information from the great book of nature which everywhere lies open before him.

Even the structure and form of a feather, a flower, a plant, a blade of grass, or a stone, may be the means of impressing the mind with just ideas of the power, wisdom, and goodness of the Supreme Being, the maker of all.

---

**SPELL country; preferred; define it. Spell cities; relish; observation; furnishes; innumerable; pleasure; fields; running; streams; rational; knowledge; obtained; author; evident; define it. Spell through; strolls; roams; forest; elements; history; pleasant; information; structure; feather; impressing; ideas; supreme.**

## AVOID ANGER: LIVE IN HARMONY.

How good and how pleasant it is to live in harmony, peace, and good feelings towards all persons!

But in order to do this at all times, we must learn to govern our tempers, our words and our conduct, so as not soon to be angry, and not willing to take or give offence.

Many things may occur that tend to excite us to be impatient, or to irritate and ruffle our tempers and passions; but if we have command of ourselves, we may avoid or suppress anger and resentment.

When occasions of provocation arise, it will very much assist us in suppressing anger, if we keep as silent as possible: for if we speak crossly or harshly, it only tends to increase the heat of passion, and to raise the like feeling of anger in others.

A sea-captain, who wanted to conquer a habit of getting angry, concluded to keep his mouth shut close until he became calm and quiet. He did so, and thus in a short time gained a command of his irritable temper.

A mother who had nine or ten children, among whom she often had trials of her patience, took this method of composing herself when any thing tried her temper: as soon as she felt a peevish or angry disposition beginning to arise, she retired to her chamber alone, and stayed there in silence and stillness, till her mind became composed and quiet. The closet of prayer will dispel the clouds of anger.

---

SPELL pleasant; harmony; towards; excite; define it. Spell impatient; irritate. Define. Spell ruffle; passions; ourselves; resentment; define it. Spell occasions; provocations; suppressing; possible; harshly; wanted; conquer; concluded; irritable; patience; method; composing; peevish; disposition; beginning; chamber; stayed; stillness; prayer; clouds.

## MIRRORS.

A MIRROR is an opaque body, the surface of which is finely polished; so that it will reflect the rays of light that fall upon it, and thus represent the images of objects.

There are three kinds of mirrors, namely, the plane, the convex, and the concave.

A plane mirror is flat, as in a common looking-glass, which is polished on one side, and silvered on the other.

The silvering of glass plates, in order to form mirrors, is made of tinfoil and quicksilver.

Tinfoil is pure tin, beaten out into very thin leaves, almost as thin as paper.

A sheet of this tinfoil is first laid on a very smooth, flat, marble table; quicksilver is then poured on, till a thin coat of it is spread all over the tinfoil. The glass is then placed on it, and pressed down with heavy leaden weights.

In this state the quicksilver dissolves the tinfoil, and mingles with it; and in a few days the mixture adheres firmly to the glass. It is then silvered so as to reflect objects.

To preserve the silvering from being rubbed off, a back or thin board is fitted into the frame of the looking-glass, which is made of mahogany or some other fine wood.

A convex mirror is a rounded or globular surface that reflects objects.

A concave mirror is a hollow surface.

---

SPELL mirror; opaque; define it. Spell surface; polished; represent; images; define it. Spell convex; silvered; tinfoil; quicksilver; beaten; smooth; poured; spread; heavy; leaden; weights; dissolves; define it. Spell mingles; adheres; define it. Spell preserve; rubbed; mahogany; convex; hollow; globular; surface; metallic; substances; looking-glasses.

Many highly polished metallic substances, and others made very smooth and bright, will reflect objects as well as looking-glasses.

## ABOUT FISHES.

Reptiles and fishes are cold-blooded animals.

In fishes that have gills, the gills perform the same office that lungs do in land-animals.

The water passes through the mouth, and out at the gills, which are fringed. This may be called their manner of breathing, and without which they could not live.

Some kinds of fish have teeth; others have only a hard, bony substance, called cartilage, with which they crush their food; others again swallow their food whole, as it is taken into the mouth. Fishes feed on flies, insects, worms, and other things.

Most of the fishes that are eaten by man, have fins and scales. The fins and tail enable them to move forward, or to turn round as they swim in the water. The scales form a smooth, shining covering for their bodies.

The eyes of some fishes are nearly globular, by which means they can see further around them. Fishes have no eyelids, and hence they can see at all times when the water is clear, and when they are awake; for it is believed that fishes sleep as well as other animals.

What are called the roes of fish, are their eggs. Some kinds of fish increase every year with amazing numbers. It is said a cod-fish spawns above nine millions of eggs in a season; and a mackarel, about five hundred thousand.

---

Spell reptiles; animals; through; fringed; breathing; cartilage; which; swallow; whole; insects; eaten; scales; enable; swim; bodies; eyes; globular; define it. Spell eyelids; believed; roes; increase; amazing; millions; thousand; scarcely; produces; devoured; multitudes; voracious; define it. Spell species.

Scarcely one in a hundred of these eggs, however, produces a fish, for many of them are devoured by other fish and by water-birds.

Many kinds of fish feed on other fishes; and hence, of the millions of eggs that hatch, vast multitudes are devoured by other large voracious species of the finny inhabitants of the deep, as well as by birds and other animals.

## VARIETY.

The pine tree may be considered as one of the most useful among the trees of the forest. For building, for firewood, for tar, turpentine, rosin, lampblack, and a great variety of other useful purposes, this tree is of much value to man.

The ebbing and flowing of the sea are called tides. These are owing to the attraction of the sun and moon; but chiefly to that of the moon.

There are two tides in every place where the waters of the sea flow, in about twenty-five hours. The attraction of the moon causes a tide in the places over which it passes, and also on the opposite surface of the sea at the same time.

The rainbow seen after a shower when the sun shines, is formed by the reflection and refraction of the rays of the sun's light from the drops of falling rain.

The field cricket is a little black animal, of the grasshopper tribe. It makes a shrill musical noise, by passing the air through a sort of net-work at its sides.

The song of the cricket and other insects, is delightful to the ear of the lover of nature, as it rises on the air from myriads of those happy little creatures.

---

Spell considered; building; turpentine; rosin; lampblack; variety; value; ebbing; attraction; chiefly; opposite; surface; rainbow; refraction; define it. Spell falling; field; cricket; grasshopper;

A fluid is any thing not solid, and that flows, or is easily put in motion. Fluids are substances which are supposed to be made of particles so very small and round that they yield or move with a very slight pressure.

If we put our hand into a basin of water, we are hardly sensible of its meeting with any resistance, because water is a fluid, the particles of which easily slide over each other.

When we move our hand through the air, we find nothing to obstruct its motion, because air is a fluid.

How many clear marks of benevolent intention appear every where around us! What a profusion of beauty and ornament is poured forth or spread over the face of nature! What a scene of wonders is presented to our view in the works of the visible creation! What abundant supplies are provided for the wants of man! What a vast variety of objects are set before him, to gratify his senses, to employ his understanding, to entertain his imagination, and to cheer and gladden his heart!

## ON HABITS OF ATTENTION AND REFLECTION.

William Penn says, in his Reflections and Maxims, "Many people come into, and go out of the world, ignorant of themselves, and of the world they have lived in. Few people know themselves: no, not their own bodies, the houses of their minds, the most curious structure in the world;—a living, walking tabernacle; nor the world, out of which it was made, and out of which it is fed: which would be so much our benefit, as well as our pleasure to know."

Again, he says, "The world is a great and stately volume

---

shrill; musical; delightful; myriads; define it. Spell fluids; particles; pressure; sensible.

Spell attention; reflection; maxims; themselves; tabernacle;

of natural things; and this ought to be the subject of the education of our youth."

It is a good thing, in early life, to gain a habit of thinking correctly. Our eyes, our ears, and our other senses, are almost constantly employed when we are awake. Through these, objects are presented to us that claim our attention, and set us to thinking.

If we want to understand the reason and operation of things, thus placed within our reach, we must observe, we must reflect, we must think and reason, or compare things that we do know, with things that we do not yet understand.

A habit of observing, or taking notice of things that occur, or things that are presented to our animal senses, is often of great use to us. It affords us the opportunity of growing wiser, or of knowing the reason and nature of things.

It is said of Isaac Newton, the great and learned astronomer, that when he was resting under the shade of a tree, the falling of an apple set him to thinking on the subject, why the apple should fall to the ground. As he pursued this inquiry, and reasoned upon the nature of falling bodies, he became acquainted with the laws of gravity.

A little boy about ten years of age, was induced to keep an account of the number of snows that fell during the winter, and the time of their falling. In itself, it was a matter of not much use; but it led him into a habit of taking notice of other things that occurred. It was the means of exciting his attention to other objects; he was induced to make notes of other passing events; and this habit was of great use to him in after life.

---

benefit. What is a benefit? Spell structure; define it. Spell volume. Define attention; operation; animal. Spell opportunity; acquainted; gravity. Define gravity. Spell habit; animal; observe.

## DIVINE PROVIDENCE.

The glorious sun is set in the west; the night-dews fall; and the air which was sultry now becomes cool. The flowers fold up their coloured leaves; they fold themselves up, and hang their heads on the slender stalks.

The little chickens are gathered under the wings of the hen, and are at rest: the hen herself is at rest also. The little birds have ceased their warbling; they are asleep on the boughs of the trees, each one with his head behind his wing.

There is now no hum of bees around the hive, nor among the sweet flowers; they have done their day's-work, and they lie close in their waxen cells. The sheep and lambs rest upon their soft fleeces; and their loud bleating is no longer heard in the fields.

There is now no sound of a number of voices, or of children at their play; nor is there the noise of busy trampling feet, or of people hurrying to and fro. The smith's hammer is not heard upon the anvil, nor the harsh saw of the carpenter.

All men are stretched on their quiet beds, and the child sleeps upon the breast of its mother. Darkness is spread over the skies, and darkness is upon the ground: every eye is shut, and every hand is still.

Who takes care of all people when they are asleep; when they cannot defend themselves, nor see if danger approaches?

There is an eye that never sleeps; there is an eye that sees in the dark night, as well as in the bright sunshine. When there is no light of the sun, nor of the moon; when

---

Spell glorious; dews; coloured; leaves; themselves; chickens; gathered; ceased; warbling; boughs. What is a bough? Spell waxen; cells; fleeces; fields; voices; busy; anvil; stretched; spread; approaches. Define approaches. Spell moon; twinkling;

there is no lamp in the house, nor any little star twinkling through the thick clouds,—that eye sees everywhere, in all places, and watches continually over all the families of the earth.

The eye that sleeps not, is God's. His hand is always stretched out over us to keep us from harm. He made sleep to refresh us when we are weary: he made night that we might sleep in quiet.

As the mother moves softly about the house, as with her finger on her lips, and stills every little noise, that her sleeping infant may not be disturbed; as she draws the curtains around its bed, and shuts out the light from its tender eyes; so God draws the curtains of darkness around us; so he causes all things to be hushed and still, that his large family may sleep in peace.

When the darkness is passed away, and the rays of the morning sun strike through your eyelids, begin the day with praising God, and feeling grateful to him who has taken care of you through the night. Flowers, when you open again, spread your leaves and your sweet smell to his praise. Birds, when you awake with the morning light, warble your thanks in the trees and among the green bushes. Let his praise be in our hearts when we lie down at night, let gratitude and love fill our souls when we awake to the light of day.

continually; families; earth; always; weary; softly; sleeping; disturbed; curtains; eyes; family; eyelids; through; spread; sweet; awake; bushes; praise; gratitude. What is gratitude? define it. Define grateful; weary; refresh.

## EVENING REFLECTIONS.

THE busy day has pass'd along,
And brought me nearer to the close,
My mind, preserved from wilful wrong,
This evening feels a sweet repose.

Repose in that Almighty Power,
Whose mercies great, and tender love
Have follow'd, to the present hour,
And rais'd my mind to things above.

What shall I render to the Lord,
For all his benefits to me?
My heart and mind, with one accord,
Bow down in sweet tranquillity.

With thanks to Him whose love divine
Inclines my soul to secret prayer;
Oh! may my will conform to thine,
That I this peace may always share.

For what is all the golden ore,
To this pure, conscious peace of mind?
This heavenly treasure 's far before
The joys that worldly men can find.

I would not change this happy state,
For all the glories earth can give:
I wish that all, both small and great,
Would taste and feel, obey and live.

SPELL busy; wrong; evening; almighty; mercies; benefits. Define benefits. Spell tranquillity, and define it. Spell conscious, and give the definition; treasure; divine; worldly; glorious; world; obey; prayer; reflections; evening; followed; ore.

## BREAKFAST.

On being called to breakfast, the first meal in the morning, and on taking a seat at the table, a solemn pause of silence ensued. It was in a family where no grace was said, nor a blessing asked by a vocal sound of words. This silent pause, I suppose, did not last more than two minutes, yet there was time enough for many thoughts to occur.

That our health was preserved, so as to furnish an appetite, was a renewed cause of thankfulness to our gracious Benefactor.

I looked over the small table, and saw the food that was set before us, and I felt grateful to Divine Providence for his bounty in thus providing for our sustenance. No costly dainties were spread upon the table, but there was enough of plain, wholesome food, to satisfy an humble appetite.

Bread, made of fine white flour, the product of the wheat that grew in the fields, excited a train of thoughts on the toil of the farmer in cultivating it. I considered the labour of ploughing, sowing, fencing, and reaping; of harvest, of hauling, threshing, and cleaning the precious wheat from the chaff. I reflected on the care, watchfulness, and toil of the farmer during more than half the year, while it was growing. But, with all this, I remembered that it was God who gave the increase; and that it is "He that maketh his sun to rise on the evil and on the good, and sendeth his rain on the just and on the unjust."

The process of grinding, boulting, or sifting the meal from the bran, and thus obtaining the pure white flour,—the skill

---

Spell breakfast; define it. Spell solemn; define it. Spell family; pause; minutes; enough; thoughts; bounty; sustenance; define it. Spell dainties; define it. Spell spread; wholesome; define it. Spell appetite; health; gracious; wheat; cultivating; ploughing; threshing; precious; watchfulness; process; boulting; define it. Spell and labour of the cook, in preparing and baking this into the bread set before me, was contemplated, with thankfulness to that gracious Being who had thus furnished a knowledge of the means by which this staff of life is prepared for wholesome food.

Butter, the product of churning the oily part of milk, called cream, which is obtained from the cows that graze the fields and meadows,—claimed a share of my serious consideration. The wonderful process, by which grass and fodder are converted into milk, through the wise and benevolent order of the Almighty Creator,—excited fresh gratitude for this luxury of life. The care and labour of the dairy-maid, in the process of making the butter, and the salt which adds so much to its agreeable flavour,—as well as how and whence this salt is obtained,—were also subjects of reflection, tending to increase the emotions of thankfulness.

The coffee, with its sugar and cream, came into review, with a train of thoughts on the labour of men, women, and children, in various parts of the world, in the cultivation of the trees that produce the coffee, and the canes from the juice of which the sugar is made;—the toils and dangers of the mariners, in transporting these articles and other groceries across the ocean,—the anxieties of the merchant, the hopes of gain in the dealer and retailer, together with the labour of carrying these products to all parts of the country, for the use, support, and comfort of men, women, and children—spread a wide field of grateful emotions before me, connected with the care and blessings of Him "who giveth food to all flesh."

**contemplated; furnished; knowledge; oily; churning; fields; meadows; consideration; define it. Spell benevolent; excited; luxury define it. Spell dairy-maid; define it. Spell agreeable; flavour, what is flavour? Spell coffee; review; emotion; juice; cultivation; manners; define it. Spell merchant; groceries; anxieties; carrying; country; women; excellent; periodical; migration; delicious; as-**

A piece of excellent broiled shad was added, as a relish, to those other good things set on the breakfast table. The periodical migration of these delicious fishes,—their ascending our rivers and streams at a particular season of the year,—the exposure and toil of the fishermen in taking them with drift or shore-nets, and sending them to market, or hauling them to our doors in wagons, together with the labour and skill of preparing them for the table,—all passed in quick succession of thought and reflection, and added to the sensations of gratitude to Him who thus bountifully provideth for the support and comfort of human life.

Nor were the various implements for our use, such as knives, forks, spoons, plates, cups, glasses, and other conveniencies, passed over unheeded or forgotten. The origin, process, and labour of preparing these for our accommodation and use, and bringing them from different parts of the world,—are subjects that demand our consideration, and our gratitude for the blessings of civilized life.

It may be thought that these numerous subjects were too copious for a silent pause of only a few minutes: but, it may be added, the whole time of eating breakfast was occupied in such a train of thoughts and reflections; for there was very little conversation with any persons at the table. I rose from it, with delightful and enlarged feelings of love and gratitude to my heavenly Father for his bounty and his care over us, and I trusted in his goodness for a blessing on the food I had eaten for the nourishment and support of my body. At the same time I felt sincere desires that his grace and good Spirit might so attend my mind, that my actions and conduct might be such as would evince my devotion to his will and service.

---

**cending; define it. Spell streams; particular; exposure; fishermen; hauling; wagons; succession; sensations; bountifully; define it. Spell implements; define the word. Spell knives; conveniencies; origin; define it. Define unheeded. Spell civilized; numerous; copious; define it. Spell breakfast; define it. Spell occupied; delightful; enlarged; heavenly; nourishment; sincere; evince. What is bread made of? How is butter obtained?**

SALT.

THERE are two kinds of common salt, or two ways of obtaining it. One is called rock salt: and this is mostly found below the surface of the earth, in a solid state.

The famous salt mines at Cracow, in Europe, are about eight hundred feet in depth. Some of them extend from east to west above six thousand feet, and in breadth about two thousand feet. The hole or opening, through which the men and horses that work in these mines are let down by ropes and pullies, is called a shaft. Through these shafts the salt is also raised by machines to the surface of the earth.

Men, women, and children, as well as horses, live in these mines, which are kept lighted with lamps. Their food is let down to them through the shafts, and there are springs of pure water found in these salt mines.

The horses are used for drawing the salt from one part of the mine to another, so as to be raised up through the shaft. It is said, there are some people who were born in these mines, that never saw the light of day.

---

**SPELL** obtaining; surface; define it. Spell Europe; depth; thousand; breadth; opening; pullies; machines; women; drawing; people; mountains. How deep are the salt mines at Cracow? Do

There are also salt mines, and salt mountains, and salt springs, in many other parts of the world.

The water of the mighty ocean is salt water. When salt is to be obtained from sea-water, or from the water of salt springs, there are large vats or pans made for the purpose. In these vats the salt water is exposed to the heat of the sun: but when large iron pans or kettles are used, it is exposed to the heat of large fires. In both cases, the heat causes the particles of fresh water to fly off, or evaporate, while the salt remains, and at length is formed into little crystals or grains.

Vast quantities of salt are made in this way, in most parts of the world. The salt springs in the remote parts of the United States, yield abundance of this useful article for the people who live there.

The fine salt for table use is made of coarse salt, purified and ground in mills.

## POTTERY—EARTHEN-WARE—PORCELAIN.

The artist, called a potter, converts different kinds of earth or clay into hard and brittle vessels of various kinds, for household use; and these are called earthen-ware, stone-ware, and china-ware, or porcelain.

The clay of which common earthen-ware is made, is found in most parts of the earth that are inhabited by man. It is the same kind of earth or clay, of which bricks are made. It contains more or less of the oxide of iron, which causes the bricks and earthen-ware to turn red in burning.

---

people live in them? Are there other places where salt is made? Spell ocean; obtained; iron; kettle; exposed; particles; evaporate; length; crystals; quantities; yield; define it. Spell abundance; article; useful; coarse.

Spell artist; pottery; porcelain; different; household; china, earthen; inhabited; oxide; selected; define it. Spell wheel

The clay being properly selected, is mixed with a little water, and put into a vat or tub, in which a wheel is turned by horse power. This grinds or works the clay into a state resembling thick mortar or dough.

After this, it is kneaded in small parcels by the potter, and then placed on a horizontal wheel, which he turns with his foot or by machinery; and with his hands or a smooth piece of wood or metal, he molds the clay into cups, bowls, plates, and vessels of various forms.

Handles, spouts, and other additions, are made in molds, or formed by the hand, and stuck on the vessels, sometimes with a cement made of plaster of Paris.

The wares thus formed, after being a little dried in the air, are placed in a kiln or oven, and baked with a hot fire till they become red hot. After this, they are glazed with a mixture of red lead and various other colouring materials.

White ware is made of fine clays, which contain so little of the oxide of iron that it does not turn red in burning.—This was formerly called queens-ware.

Stone-ware is made of a coarser kind of clay, containing little or no oxide of iron. The glazing of stone-ware is done by throwing a quantity of common salt into the kiln, when the heat is greatest.

Porcelain, formerly called china-ware, is among the finest kinds of pottery. It is of a middle nature between glass and earthen-ware.

Porcelain is made of a kind of earth or clay, called kaolin, mixed with another sort of soft white clay, called petunse; to which is added a chemical substance, called sulphate of barytes.

---

resembling; kneaded; horizontal; define it. Spell machinery; molds; cement; kiln; glazed; mixture; coarser; oxide; throwing; quantity; earthen; mortar; kaolin; petunse; chemical, barytes;

These are all mixed together, and burnt in a furnace, until they are so dry as to be sifted through a silken sieve.

To this fine powder or dust, water is added, and the mass is boiled till it becomes about as thick as good cream. It is then left to cool, till it becomes like a tough paste.

In this state it is ready to be molded, or formed on a turning-wheel into cups, saucers, bowls, tea-pots, and other articles for table use, or ornaments.

The handles, spouts, and other appendages, are formed by hand or in molds, and attached to the vessels.

After the various articles of porcelain are thus prepared, they are placed in a kiln or furnace, and exposed to a red heat for more than two days. The furnace is then left to cool gradually.

The paint and colouring of various figures are next put on, and then the glazing, which is made of lead and glass, reduced to a fine powder and mixed with gum water and other things. After which, the porcelain is again heated in the furnace.

It is said porcelain passes through seventeen different processes, before it is completed, and employs a great many men.

---

furnace; sieve; boiled; tough; molded; wheel; ornaments; porcelain; gradually; figures; colouring; processes; completed. What is porcelain made of?

## MY MOTHER.

Who fed me from her gentle breast,
And hush'd me in her arms to rest,
And on my cheek sweet kisses prest?
My mother.

When sleep forsook my open eye,
Who was it sung sweet lullaby,
And rock'd me that I should not cry?
My mother.

Who sat and watch'd my infant head,
When sleeping on my cradle-bed,
And tears of sweet affection shed?
My mother.

When pain and sickness made me cry,
Who gaz'd upon my heavy eye,
And wept for fear that I should die?
My mother.

Who drest my doll in clothes so gay,
And taught me pretty how to play,
And minded all I had to say?
My mother.

Who ran to help me when I fell,
And would some pretty story tell,
Or kiss the place to make it well?
My mother.

Who taught my infant heart to pray,
To look to God both night and day,
And strive to walk in wisdom's way?
My mother.

---

**Spell** mother; gentle; breast; sweet; kisses; forsook; lullaby sleeping; sickness; should; heavy; clothes, taught; pretty; minded; cradle; sleep; wept; who; hush'd; cheek; taught; infant; heart;

And can I ever cease to be
Affectionate and kind to thee,
Who wast so very kind to me,
My mother?

Ah! no: the thought I cannot bear;
And if God please my life to spare,
I hope I shall reward thy care,
My mother.

When thou art feeble, old, and gray,
My healthy arms shall be thy stay,
And I will help thee night and day,
My mother.

And when I see thee droop thy head,
'Twill be my turn to watch thy bed,
And tears of sweet affection shed,
My mother.

For God who reigns above the skies,
Would look with vengeance in his eyes,
If I should ever dare despise
My mother.

## THE FROG, OR TOAD.

In natural history, there is a class of animals called amphibious, which can live either on land, or in the water Among these are frogs, toads, lizards, tortoises, and serpents, or snakes.

The common frog or toad, at first is an egg, which is laid

---

strive; walk; wisdom; cease; affectionate; define it. Spell thought; bear; please; reward; feeble; healthy; droop; head; watch; tears, sweet; affection; define it. Spell mother; reigns; skies; would vengeance; eyes; should; despise; mother.

Spell natural; history; animals. What is an animal? Spell amphibious; toads; lizards; tortoises; serpents; stagnant; define it in the edge of a pond of stagnant water. After about twenty days of warm weather, a tail appears to peep out of this egg, and it soon becomes a tadpole.

If a tadpole be carefully examined, there will appear, just below the head, two little fins like fringes. By the help of its tail, with these fins the little animal can swim about in the water to find its food.

When a tadpole is about three months old, and has grown to some size, two small feet appear to sprout, or grow out near its tail. These feet enlarge, and soon become the hind legs and feet of the frog or toad.

In a few days, the arms or fore feet grow out of its body in the proper place toward the head; and after a while the tail disappears.

The tadpole now becomes a full shaped little frog, and leaves the water to seek its food upon the land. He now lives upon insects and worms, which he finds in the grass and among the weeds near the water. These he catches, by thrusting out his long tongue with a quick and rapid motion, and drawing them into his mouth.

The frog is a very timid creature; and, in case of any alarm, it hastily jumps into the water to hide itself. Its hind legs are very well adapted to leaping, being very springy or elastic.

The frog is called an amphibious animal, because he can live in the air on land, or in the water. But though frogs can live several minutes in the water, they have to come to the surface to get fresh air; for frogs breathe, as well as other land animals.

In winter, they remain in a torpid state, hid in the mud,

---

Spell weather; tadpole; examined; fringes; swim; grown; sprout; enlarge; disappears; define it. Spell leaves; insects; weeds; catches; thrusting; tongue; rapid; timid; define it. Spell creature; hastily; adapted; define it. Spell springy; elastic; amphibious;

or in some secure place till the return of spring. As soon as the weather begins to grow warm, the frogs emerge from their winter beds, and seem to have new life and joy, which is manifest by their enlivening music in the swamps and marshes where they abound.

The common land toad seldom returns to the water, after leaving the tadpole state, unless to lay its eggs. It is not only a harmless, but a very useful little animal about the house and garden. It destroys a great many flies, bugs, insects, and worms of various kinds. In the dusk of evening, it may be seen crawling from its retreat, and seeking its food; which it secures by the quick motion of its long and hooked tongue.

Lizards are somewhat like short snakes in the appearance of their heads, bodies, and tails; but they have four short legs, on which they move about—and their forefeet are like a hand. Lizards, as well as tortoises and snakes, lay eggs, which hatch into young ones.

The land tortoise is a quadruped which is covered with a strong shell. Into this it can draw its head and feet, and shut itself up close. This appears to be its only defence against its enemies.

It is a harmless creature, and lives on fruit, grass, or other vegetables. It sometimes lives to a very great age; some say a hundred and twenty years.

Some species of the tortoise live mostly in the water; such as the sea-turtle, the snapping-tortoise, and the hawks-bill turtle. Of the shell of the latter, combs, snuff-boxes, and other articles are made.

---

minutes; surface; breathe; torpid; define it. Spell weather; emerge; define it. Spell music; swamps; marshes; crawling; retreat; tongue; lizard; appearance; tortoises; eggs; young; quadruped. What is a quadruped? Spell defence; creature; vegetables; define it. Spell species; tortoise; snapping.

## AGRICULTURE.

A **FARMER** is a person who tills the earth, and cultivates the soil by manual industry.

In the Eastern and Middle States, farmers raise wheat, rye, corn, buckwheat, barley, oats, flax, peas, beans, potatoes, pumpkins, and various kinds of grasses.

In the Southern States, those who have large tracts of land under cultivation, are called *planters*. They raise corn, wheat, tobacco, cotton, rice, and sugar-cane; together with some hemp, oats, and sweet potatoes.

The plough is generally used to prepare the ground for the seed; after which it is harrowed and pulverized.—Wheat, rye, oats, barley, peas, and hemp and flax-seed, are generally sowed by the hand, which is called *broad-cast*. The ground is then harrowed again until the seed is covered.

---

**SPELL** agriculture; manual; wheat; buckwheat; barley; peas potatoes; pumpkins; cultivation; tobacco; plough; harrowed; pulverized; broad-cast; covered; furrows; mellow, plough; sickle.

Corn, beans, potatoes, pumpkins, and sweet potatoes, are planted in rows or furrows, and covered with the hoe. To keep the soil loose and mellow, and to destroy the grass and weeds, the plough and the hoe are often used among or between the rows of plants.

Wheat, rye, barley, and oats, when ripe for harvest, are cut and gathered with the sickle, or scythe and cradle. They are then bound up in sheaves and stacked or put into the barn. Afterwards the grain is threshed out, or separated from the straw, with a flail, or trampled out by horses, or passed through a threshing-machine that is worked by horse-power.

The chaff, dust, and loose matter, are blown out from the pure grain by means of a fan, or cleaning-mill that is turned by hand. The wheat and rye are then measured in bushels, put into bags, and taken to the mills to be sold, or ground into flour for making bread.

Indian-corn is husked by hand, and potatoes are dug with a hoe, or ploughed out, and gathered by hand.—Grass is mowed with the scythe, dried with the sun and made into hay, which is put in stacks or barns for fodder.

Rice is first sown on a piece of rich, mellow ground. When the plants have come up and grown six or seven inches high, they are transplanted into rows, and covered with water. In this state they remain till the crop ripens for harvest. It is then cut and gathered with sickles, and then threshed out like wheat. The husks or hulls are beaten or rubbed off, by passing the grain through a mill or machine for the purpose. The rice is then cleaned by a fanning-mill, and put up for use, or to be conveyed to market.

---

scythe; sheaves; flail; straw; threshing-machine; cleaning-mill; measured; flour; Indian-corn; husked; ploughed; piece; grown; dried; inches; transplanted; ripens; harvest; sickles; threshed; beaten; fanning-mill; conveyed; buckwheat; barley; oats; brewer;

Buckwheat is threshed with flails. Barley and oats are threshed and cleaned like wheat. The barley is sold to the maltster or brewer, and is used in making beer.—Oats are mostly fed to horses, or ground with corn or other grain for feed for cattle and hogs.

Sugar-cane is propagated by means of cuttings from the lower end of the stalks, which are planted in furrows made by the plough. The new plants grow up from the joints of the cuttings, and the ground is kept clear of weeds, by the plough or the hoe, like Indian corn.

When the cane is ripe, it is cut and brought to the sugar-mill, where the stalks are pressed between two stone or iron cylinders. The sweet juice which runs out, is boiled down to a syrup, and then removed to coolers, where it begins to granulate. It is then filtered, so as to let the molasses drain away.

The sugar is then purified, by boiling it with lime and bullock's blood, and passing the syrup through several canvass filters or strainers. Loaf or lump sugar is the pure syrup, poured into molds and left to cool.

Farmers, in newly settled parts of the Northern and Western States, obtain large quantities of sugar from the sugar-maple tree. By making holes in these trees early in the spring, a sweet juice runs out, which is boiled to a syrup and made into sugar, in the same manner as the cane juice.

maltster; propagated; cuttings; stalks; furrows; joints; weeds; iron-cylinders. What is a cylinder? Spell juice; syrup; boiled; coolers; granulate; define it. Spell strainers; molds; settled; northern; maple; syrup; filtered; define it. Spell molasses; canvass; poured.

## SPICES.

Spices are vegetable articles that are used in cookery. They are either fragrant to the smell, or pungent to the taste, and add an agreeable flavour to various kinds of food prepared for the table.

Nutmegs grow on trees in the East Indies. The leaves of the nutmeg tree resemble those of a peach tree. The blossoms are very much like some of our roses, and the fruit is nearly the size of a common walnut.

The nutmeg is enclosed within two cases or covers; the outside pulp or hull is thick and coarse. After this is taken off, the inner coat or bark which covers the nutmeg, is thin, and of a reddish-yellow colour. This is the fragrant spice called *Mace.* We now come to the kernel, or nutmeg, which is dried and put up for the market as we see it.

Nutmegs are chiefly raised in the Banda islands; but some are cultivated in the West Indies.

Cloves are the buds of trees or shrubs that grow about as high as common laurel. These buds are of a reddish colour when gathered; but they become brown in drying. When well dried, they are ready for use.

Cloves are mostly procured from Amboyna, one of the Molucca islands in the East Indies.

Pepper is the fruit of a feeble, climbing plant, or vine, which is placed near some large tree, or other support. Pepper grows on this kind of vine, in clusters of twenty to thirty grains. These berries at first appear green, but as

---

Spell spices; nutmeg; resemble; define it. Spell blossoms; walnut; enclosed; coarse; yellow; fragrant; define it; Spell kernel; chiefly; cultivated; shrubs; laurel; drying; Amboyna; East Indies; climbing; thirty; berries; colour; spread; Ceylon; cinnamon; a.

they ripen they turn to a red colour. When gathered, they are spread in the sunshine, which soon turns them black and dries them. In this state they are ground fit for table use.

Pepper comes to us from Ceylon and other East India islands.

CINNAMON is the inner bark of the young and tender branches of a tree, which grows in the island of Ceylon. This is peeled off, after the outer bark is removed. It is then dried and put up for use.

ALLSPICE, or PIMENTO, is the fruit of a shrub that grows in the West India islands. It is called allspice, because its smell is nearly similar to nutmegs, cloves, and cinnamon, all mixed together.

GINGER is the root of a plant which grows two or three feet in height, and somewhat resembles a rush. When the ginger plant is fully grown, it is dug up; and the roots, which spread out just below the surface of the ground, are carefully picked, scraped, washed, and dried in the sunshine. These roots being ground in a mill, are then fit for use.

Ginger was formerly brought from Calicut, in Asia, but it is now cultivated in the West Indies.

CAYENNE PEPPER is brought from Africa; it has a strongly pungent taste, and is used for medicine as well as the table. The common red pepper which is raised in the United States, when dried and ground in mills, answers the same purposes, though not so strong as the imported Cayenne pepper.

---

**spice; pimento, ginger; spreading; surface; scraped; ground Cayenne; Africa; pungent; define it. Spell medicine; answers purposes; imported. Define imported.**

## ABOUT OURSELVES.

There are about two hundred bones in a human body, and the number of muscles exceeds four hundred.

The muscles are composed of a soft, fibrous, fleshy substance; such as the soft fleshy part of the hand, the calf of the leg, and the cheeks. Many of the muscles form tendons or sinews, such as those hard, gristly parts at the joints of the feet, legs, arms, and on the back of the hand.

It is by the strength of the muscles, tendons, and bones, that we are able to walk or run, or to lift up heavy things, or to hold any thing in our hands. In short, every action we perform brings into exercise some of those four hundred muscles.

---

When we are asleep, our eyes are closed so that we see not what is passing around us, even in the day-time; because our eyes need rest, as well as the other parts of our weary bodies.

But our ears are open, when we sleep as well as when we are awake, and yet we hear not the common noises that are made around us.

As the eyes are provided with lids that shut them up from the light, and protect them from injury while we sleep, so the ears are furnished with a very bitter kind of wax that is very offensive to insects, and prevents them from running into our ears while we are asleep, as well as when we are awake.

In thus protecting our eyes from dangers, and our ears

---

Spell muscles; composed; fibrous; fleshy; tendons sinews gristly; joints; strength; heavy; actions; exercise; hundred; asleep; eyes; passing; weary; noises; provided; injury; while; furnished; offensive; protecting; dangers; insects; generous; manifest; define it from insects and hurtful things by a soft, sticky, and bitter wax which drives them all away, the kindness, the wisdom and goodness of our gracious Creator are manifest, and demand our love, gratitude, and praise.

When a boy cuts his finger through the skin with a knife, or when a brier scratches his foot and tears the skin, the blood runs out at the wound.

This is because the pressure of the blood is from the heart outwards; and the skin and small blood-vessels being opened, the blood issues from the wound, instead of returning back to the heart.

The circulation of the blood consists in a natural motion of it in every living animal. By this means, the blood is conveyed from the heart to every part of the body, by little tubes called arteries; it is then returned again to the heart by means of the veins, from all those parts.

It is found in a healthy person, that the blood circulates through the heart once in about four or five minutes.

As the blood is continually nourishing all parts of the body, and wasting by perspiration and various other ways, so it is constantly receiving fresh supplies from the wholesome food that we eat, after it has become properly digested in the stomach.

How complicate! how wonderful a being is man!

**Spell gratitude; through; knife; brier; scratches; tears; wound; pressure; outwards; opened; issues; instead; circulation; motion whereby; fluid; define it. Spell conveyed; arteries; veins; healthy; circulates; heart; minutes; continually; nourishing; perspiration receiving; stomach.**

## OF METALS

**Metals** may be defined as simple, heavy, shining bodies or particles of matter, that become melted by heat, and that harden with cold.

When metals are first dug out of the earth, they are often mixed with stones and other things. In this mixed and impure state, they are called ores.

A mine is a place where ores and metals are found. Mines are sometimes dug to a great depth and extent in the earth, or in mountains.

**Gold** is sometimes found in mines; it is also obtained from the bottoms of some rivers, where it is mingled in small grains with the sand, and is called gold dust.

Gold is a very heavy metal, of a rich yellow colour. It is coined into money; which in this country is called eagles, half eagles, and quarters. English guineas and other foreign coins are made of gold.

Gold is of such a ductile nature, that it may be drawn out into very fine wire, and so malleable that it may be hammered or beaten out into leaves, so thin that one grain will cover more than fifty square inches.

**Silver** is a rich white metal. It also has, for many ages, been used as money. Dollars, half dollars, quarters, and dimes (or ten cent pieces) are made of silver.

Silver is sometimes found in the mines, nearly in a pure state; but it is often mingled with antimony, sulphur, and other substances.

---

**Spell** metals; particles. Define metals. What is an ore? Spell depth; extent; obtained; mingled. Where is gold obtained? What is it used for? Spell heavy; coined; money; guineas; foreign. Define foreign. Spell ductile; define it. Spell malleable; define it Spell eagles; dollars; square; quarters; country; yellow; colour

The ductility of silver is such, that it may be drawn out into wire much finer than a hair. It is also capable of being made into leaves, so thin that it would take more than ten thousand of them to make the thickness of an inch.

Silver is used for making watch-cases, cups, spoons, and various other articles for domestic use.

Copper is mostly found in mines very deep in the earth. It is a very useful metal, of a reddish colour.

Copper is formed into thin sheets by heating it in a furnace, and pressing it between iron rollers. These sheets are used for covering the bottoms of ships, and for making boilers and kettles: also sometimes for covering the roofs of houses.

Cents and half cents are made of copper. It may also be drawn out into wire, and is easily melted.

Brass is made of copper and zinc mixed together, in the proportion of three or four parts of copper and one of zinc; to which some lead is added to make it more soft.

Brass is used in making the small wheels of watches and clocks, and for many other purposes of use and ornament.

## METALS, *Continued.*

Tin is a metal which has a fine white colour like silver. When fresh, it shines with great brightness.

Most of the tin comes from Cornwall, in England. Some of the tin mines there are said to be near seven hundred feet deep.

---

mingled; antimony; sulphur; ductility; define it. Spell capable; thickness; various; domestic; rollers; boilers; kettles. Where is copper found? What colour is copper? How is brass made? Spell zinc; lead; wheels; purposes; watches; ornaments; colour.

What is commonly called tin-ware, consists of thin plates or sheets of iron dipped in melted tin. A bright coating of the tin sticks to the iron, and forms what are called tin plates; which are made into pans, cups, and many other articles for domestic service.

*Bell-metal* is composed of four parts of copper and one of tin. It is very hard, sonorous, and elastic. Hence the ringing sound of bells, when struck with any hard substance.

Tin may be hammered out, or pressed between heavy steel rollers into very thin plates or leaves; and these are called *tin-foil.*

The main body of PEWTER is tin. Lead and brass in small quantities are mixed with the tin, and the compound is called pewter; of which plates, basins, porringers, spoons, and other articles were formerly made.

ZINC is a metal of a whitish-gray colour, with a shade of blue. It is a heavy metal, and is worked into sheets for covering houses, and other purposes.

LEAD is of a bluish-gray colour. It is one of the softest of metals: it may be cut with a knife, and is easily melted. Lead is a heavy metal, and is used for making shot, leaden pipes, and sometimes, when rolled into large sheets, it is used for lining cisterns, and for covering houses.

A shot factory is a very high building, near the top of which the melted lead is poured through a sieve, and the drops fall into a cistern of water near the bottom. The pressure of the air makes every drop of lead perfectly round, as it is falling; and the water not only prevents it from flatting, but cools the shot thus formed.

---

SPELL brightness; England; coating; domestic. Where does tin come from? Of what is bell-metal composed? Spell sonorous define it. Spell elastic; define it. What is zinc? Of what colour is lead? Spell cisterns; factory; building; through; sieve; cistern:

White lead is a paint that is made out of common lead, by the action of strong vinegar. This corrodes the surface of the lead, and produces the white lead. Litharge is made of lead in the same manner.

Red lead is also a paint, produced by the action of fire, so intense as to convert the common lead into a fine powder.

Black lead is not a metal, but a mixture which chemists call a carburet of iron. Black lead is also called plumbago. It is used for rubbing stoves and grates, and also for making pencils.

Platina is said to be the heaviest of all the metals. It is nearly as white as silver, and very difficult to be melted.

It is hard, ductile, and capable of being hammered out into thin plates. It may be drawn out into very small wire. If exposed to the air, it suffers no alteration of its bright silver colour. It is therefore used to plate the tops or points of lightning rods that are attached to buildings.

---

## IRON.

Of all the metals, as iron is the most useful, so it is most abundant. It is found in many parts of the earth; that which is dug out of hills and mountains, is called mountain ore. Another kind, called bog ore, is found in wet or marshy ground, and appears like red or yellow earth.

Mountain ore is of a reddish-brown colour; and it often appears like rocks or lumps of stone.

The iron ore in its rough state is conveyed to the blast-

---

pressure. How is shot made? What is white lead? Spell vinegar, corrodes; define it. Spell surface; litharge; intense; powder. How is red lead made? Spell mixture; chemists; carburet; plumbago. What is plumbago? Spell pencils; platina; ductile; define it. Spell alteration; lightning; buildings.

Spell iron; metals; abundant; earth; mountains; marshy;

furnace, which is built of brick or stone, from twenty to forty or fifty feet high, in the shape of a round hollow stack.

When a blast is to be made, this furnace is filled with charcoal, that is set on fire and kept burning with intense heat, by means of large bellows worked by steam or water-power.

The iron ore, being broken into small pieces, is thrown into the furnace at the top part of it; at the same time more charcoal is added, with a portion of lime. This is often repeated, so as to keep the furnace full during the time of a blast, which sometimes continues for weeks and months.

As the ore melts, it runs down to the bottom of the furnace through a grate, where a close hearth made of sandstone receives it. From one corner of this hearth, the melted iron is let out into hollows or gutters made in a bed of sand, where it cools. In this state it is called pig-iron.

When a foundry is attached to the blast-furnace, various kinds of castings are made of the iron in this state; such as stoves, grates, flat-irons, mill-irons, pots, kettles, and other utensils.

When the iron is to be brought into a state to be worked on the anvil with a hammer, the pig-iron is again heated in a furnace or forge, and in that state passes under a huge hammer of great weight, worked by water or steam-power. These hammers are called tilt-hammers.

Instead of these tilt-hammers, or after the iron has passed under them, heavy rollers are used; between which the iron in a red-hot state passes a number of times, till it becomes soft and tough, when it is formed into bar-iron, sheet-iron, and other preparations for usefulness.

---

yellow; rough; conveyed; define it. Spell furnace; built; charcoal; intense. Define intense. Spell bellows; pieces; portion; repeated; continues; bottom; hearth; foundry; attached; various; grates;

Iron is converted into steel, by being highly worked, and refined by a process in which it is mixed with powdered charcoal and other things, and inclosed with clay so as to exclude the air. In this state it is kept red hot for eight or ten days, and then becomes blistered steel.

Blistered steel, after passing through another process of refinement, becomes cast-steel.

The blacksmith works in wrought-iron and steel. It is one of the most useful trades in civilized society.

Cutlery is properly a branch of the same business, though sometimes considered a distinct trade. Cutlery embraces the finer kind of edge-tools, or those used for cutting. Surgical instruments, and a great variety of the polished kind of utensils, such as knives, forks, penknives, lancets, scissors, razors, &c., come under the name of cutlery.

## HOME.

Hail! lovely cot,
A pleasant spot,
The poor man's lot,
Content may hither come:
Let others bound
The world around,
No peace is found
Like this I find at home.

kettles; utensils; define it. Spell brought; forge; weight; heavy; rollers; tough; preparations; usefulness; converted. What is converted? Spell highly; process; powdered; charcoal; exclude define it. Spell eight; blistered; another; refinement; blacksmith wrought-iron; civilized; society; cutlery; properly; business, though; considered; distinct; embraces; surgical; instruments variety; polished; knives; lancets; scissors; razors; cutlery.

When morning bright
Spreads forth the light,
On mountains' height,
I from my cottage stray,
The ground to till,
And so fulfill
My Maker's will,
By working through the day.

With musing head,
The fields I tread,
To earn my bread,
Nor e'er regret my doom;
Though I am poor,
And live obscure,
I feel a pure
And calm delight at home.

The horrid car
Of bloody war
May roll afar,
But hither does not come;
While hundreds slain
Lie on the plain,
I here remain
In quiet peace at home.

For sake of gain,
The merchant train
Sails o'er the main,
Where raging billows foam;
While I prepare,
With little care,
My simple fare,
Content, though poor, at home.

---

Spell pleasant; spreads; height; cottage; fields; tread; obscure; define it. Spell bread; horrid; merchant; raging; foam; states

The statesman proud,
May speak aloud
Amidst the crowd,
In splendid Congress room;
I envy not
His public lot,
While in my cot,
I love my quiet home.

With curious taste,
And dang'rous haste,
O'er all the waste,
The traveller may roam
He seeks to gain
The praise of men,
While I remain
Contented at my home.

And yet the mind,
To seek inclin'd,
May often find
The best of knowledge here:
Ourselves to know,
And what we owe
To man below,
And God above to fear.

Heaven grant I may
Thus pass away
In peace each day,
Nor e'er from virtue roam;
And when I die,
In realms on high,
Beyond the sky,
Find an eternal home!

---

man; splendid; define it. Spell traveller; dangerous; knowledge ourselves; realms; eternal; beyond.

## EARLY SETTLEMENTS OF PENNSYLVANIA.

The early settlers of Pennsylvania were called colonists; because they were a company of people who came from Europe, and formed a colony in this country.

For some time after their arrival here, their efforts were chiefly directed to the procuring of food and shelter by their own industry. Their places of shelter from rain and storms, were either caves, or rough log houses one story high, and having but one or two rooms on the ground-floor. The place chosen for their dwelling, was mostly near a good spring of running water. In these simple habitations, they and their families lived, and began to clear and improve their farms.

The native Indians continued to dwell in their wigwams, wherever they happened to be, as long as they chose to remain among the white people. Thus, the settlers and the Indians lived together in harmony and peace; so that the colonists, being void of fear, did not think it needful to provide any other fastening for their doors, than a simple wooden latch, to prevent the winds from blowing them open, and to guard against the nightly entrance of wolves, bears, and other vermin.

In these rough houses, or cabins, often without a single pane of glass in the windows, the mother and her infants would sleep in perfect safety alone, while the husband and careful father was absent on business, or to procure food for his family.

It was a custom among the native Indians, long before the settlement of the country by the white people, that when an Indian was hungry, he had the right to enter the wigwam

---

SPELL Pennsylvania; settlers; colonists; Europe; colony; efforts; country; chiefly; rough; dwelling; running; habitations; families; Indians; wigwams; define it. Spell wherever; fastening; wooden;

of his friend, either by day or by night, and help himself to such food as he could find, for the supply of his present want. This rule or custom, by mutual consent, was such as required no apology from one to another.

As the native Indians mixed with the white people in habits of friendly intercourse, they used the same freedom, when hungry, of helping themselves to food; and expected the settlers to do the same with them, without asking any questions.

But if an Indian entered the house of his white neighbour in the night, in search of food, (and this he could do at any time, by merely raising the latch by a string,) his first care was, without noise, to know whether the man of the house was at home. If he found him with his family, he then felt himself at liberty to kindle a fire, and cook such food as he could find in the house; and when he had satisfied his hunger, he would go away without saying a word, or disturbing the sleeping family. But if the husband was absent, the Indian would gently close the door after him, and leave the house and family, without getting any thing to eat, however hungry he might be.

This shows the friendly care and caution which the Indians observed, lest such visits should alarm the women and children, when they were alone. They not only used the freedom of satisfying their hunger in the houses of the white people, but often in times of scarcity and want, they furnished corn and other provisions, without any other compensation than the pleasure of doing good to the new settlers. Indian sympathy, Indian hospitality and kindness, sprang from the same good principle in them, as in civilized people.

---

guard; cabins; business; settlement; people; mutual; apology; friendly; intercourse; questions; merely; disturbing; friendly; caution; satisfying; scarcity; compensation; define it. Spell sympathy; hospitality; civilized.

## NATURAL HISTORY.

NATURAL history may be defined to be the study and description of natural things, or the works of the Creator in the visible world. It is, in a manner, the most noble, and the most certain subject of natural knowledge that can occupy the mind.

The facts of the works of creation are fixed and certain; and the history of a plant, an insect, an animal, or any other natural object, may furnish evidences of the wisdom and goodness of the great Creator.

Natural history embraces the whole world of matter, and it is adapted to every stage and condition of life. The desire to inquire and know, is never more active than in the season of youth. Children are capable of the study and knowledge of natural history, at a very early age. A garden, a field, an insect, a flower, an animal, and every natural object around them, is as an open book before them, in which they should be taught to read.

William Penn says, "The world is a great and stately volume of natural things; and this ought to be the subject of the education of our youth."

Natural history is commonly divided into several branches, and these are called by different names. The natural history of animals, or living creatures of every kind, is called Zoology.

The natural history, with the description of plants and vegetables, is termed Botany.

---

SPELL natural; history; description; visible. What is natural history? Spell certain; knowledge; creation; insect; animal; evidences; define it. Spell embraces; adapted; define it. Spell condition; knowledge; field; object; divided; creatures; zoology; description; vegetables; botany; minerals; mineralogy; geology. What is zoology? What is botany? mineralogy? geology?

The natural history of minerals, is called Mineralogy, and that of the earth and its various parts, bears the name of Geology.

## THE BAT.

It has been a doubt, with some of those who have written the history of beasts and birds, whether the Bat should be placed among the former or the latter class of animals. But it seems now to be agreed that a bat is not a bird, but a quadruped; that is, an animal with four feet.

The common bat is about the size of a small mouse, and its body is covered with fine soft hair. What are called its wings, is a skin reaching from its toes all round it, except the head, and when spread out like a sail, it can fly in the air with a swift, though not very regular motion.

The head of the bat is like that of a mouse, with teeth and eyes and ears, like that little animal. Its toes are like little hooks or claws, by which it can suspend itself to the side of a wall, or to any thing it can lay hold of.

In the dusk of evening, when the weather is warm, it sallies forth from its hiding-place in old roofs, or cracks of boards, or other crevices where it retreats in the day-time. It flies about in pursuit of insects for food, which it can see in the twilight, and catch as it flies.

Even in summer, the bat passes much of its time in sleep, and in winter it confines itself wholly to its nest, or place of retreat, where it remains hanging by its claws in a torpid state, till warm weather returns, and restores it to life and vigour.

---

SPELL written; quadruped. What is a quadruped? Spell mouse. Is a mouse a quadruped? Spell spread; except; swift; eyes; teeth; claws; evening; weather; sallies; crevices; pursuit; twilight; wholly; retreat; torpid; define it. Spell warm; vigour; innocent; injury; people; allured; cruelty; dangerous; vermin; wanton; dumb; define it. Spell inflicted; knocking.

The common bat is an innocent little animal, that does not appear to do any injury to mankind: yet some people are very much afraid of them when they fly into the house, on a warm summer evening, allured no doubt by the light of the candle, in order to catch flies.

Much cruelty is sometimes committed, by knocking them down, as if they were dangerous vermin. But we ought to have a tender feeling for dumb animals, that cannot complain of the wanton injuries inflicted on them.

## FLAX.

**Flax** is a slender plant with a long stem, usually growing from two to three feet in height. Near the top, it branches out, and bears a small pale-blue flower, which produces the seeds. These seeds are brown and flat, and are sometimes called linseed.—They yield an oil that is very useful in painting houses, and it is often known by the name of linseed oil.

The flax ripens about the time of wheat-harvest; that is, the bolls, or capsules which contain the seed, turn brown. It is then time to gather the flax; which is done by pulling it up by the roots, and binding it in small sheaves. When these are fully dry, they are housed in a barn or outbuilding, to keep them from the rain.

The next process is to beat out the seed. This is easily done by striking the seed end of the flax-sheaves against a large flat stone, till all the seed is separated from the stalk.

The flax stalks are then to be spread thin on the ground, in rows, and left out exposed to rains and dews for a few weeks, until the stem becomes rotted so that it may be

---

Spell flax; usually; height; blue; produces; yield; painting; linseed-oil. What is linseed-oil made of? Spell wheat-harvest; capsules; gather; sheaves; building; process; separated; stalks; spread; dews; immersing; define it. Spell effected; define it. Spell easily broken to pieces. In some places, the process of rotting the stalk is carried on by immersing the flax in water, and keeping it so till it is fully rotted.

When this is effected, the flax is raked up in bundles or sheaves, which are bound and put into a dry place, ready for the process of breaking and swingling.

A flax-brake is a machine made of wood, with bars fitting into, or working between each other. Through this, the flax is several times passed, until the rotted stalk is broken into short pieces, while the lint or bark remains whole.

The outside bark, or fibrous part, is then swingled; or beaten with a wooden knife or machine, till it is separated from the broken parts of the inner stalk, and becomes of a fine, soft, silky nature.

The next operation is called hackling; which is done by repeatedly drawing the fibrous flax over and through a hackle. This is a machine, composed of long sharp-pointed steel spikes, set in a board or block of wood.

Hackling separates the coarser and broken fibres and particles of the stalk that may adhere to the flax, and makes it smooth, clean, and even,—ready for spinning.

The coarser parts thus hackled out, are called *tow*, and are spun for ropes and cordage, or made into strong coarse cloth, fit for bags, wrappers, and clothing.

The spinning of flax is done by a machine called a little spinning-wheel, which the spinner turns with her foot placed on a treadle—while she draws out the thread from a distaff, and winds it on a spool. Flax is also spun into threads at manufactories, by means of machinery. It is then ready to be woven into linen of various kinds.

---

bundles; breaking; swingling; flax-brake; machine; between; pieces; whole; outside; fibrous; define it. Spell knife; operation; hackling; repeatedly; drawing; coarser; adhere; define it. Spell spinning; coarser; wrappers; treadle; thread; distaff; machinery manufactories; linen; various.

## COTTON.

Cotton is a soft, white, downy substance, that is the product of a plant or shrub which grows to the height of four or five feet, and sometimes more.

The cotton seeds, or plants, are set in rows, seven or eight feet apart, and the ground between them is kept clear of weeds by the use of the plough or hoe.

As the plants grow, they are pruned, so as to make them produce a greater quantity of cotton. They bear a brown pod, which encloses the seed; and this is wrapped up in a white woolly substance, which is the cotton.

When the seed ripens, the pod cracks open, and the cotton and seeds are gathered by hand. As the seeds stick closely to the cotton, they have to be separated from it by hand, or by a machine called a cotton-gin.

The cotton is then ready to be packed in large coarse bags, called bales. This is done by machinery, which presses the cotton so hard and close, that it seems almost solid. It is then ready for shipping, or to be sold in the market.

When these bales are brought to the cotton manufactories, the cotton is unpacked, and then carded and prepared for spinning by machines, worked by water or steam power. The whole process of spinning and weaving is also carried on by machinery, worked by the same power.

Great quantities of cotton are raised in the Southern States, also in South America and the West Indies. Cotton is also cultivated in the southern parts of Europe—and abundantly in Asia and some parts of Africa.

---

Spell shrub; height; plough; wrapped; woolly; machine; cotton-gin; ready; machinery; shipping; manufactories; spinning; weaving; quantities; America; West Indies; cultivated; Europe; abundantly; Asia.

## HEMP.

HEMP is a plant that grows to the height of from five to seven feet. It bears a blue flower, and the seeds are used for feeding birds that are kept prisoners in cages. Sometimes an oil is pressed out of hemp seed, called rape-oil.

The bark is of a fibrous, stringy quality, and this is the part of the plant that is made into thread, twine, cordage, cables, and sail-cloth.

When the seed is ripe, the hemp-stalks are pulled up by the roots, and dried. They are next threshed with a flail to loosen the outside bark, and then put into water to soak, until the fibrous bark begins to separate from the stalk.

This bark being taken from the stalk, is next to be reduced into tow, by combing or hackling it, like flax. After passing it through several hackles, first coarser, then finer, it becomes a mass of regular, slender, and fibrous threads, which are called tow.

The tow is then spun into threads, finer or coarser, according to the work or articles for which it is intended. Because hemp is very strong and durable, much of it is made into a coarse cloth, called canvas or sail-cloth, of which the sails of ships, sloops, and other vessels are made; also sacking-bottoms, bags, and other articles. Much of it is also used by rope-makers for twine, cordage, and large ropes.

After hempen articles are worn out, the remnants and

---

SPELL height; blue; prisoners; fibrous; define it. Spell stringy; quality; thread; twine; cordage; sail-cloth; pulled; threshed; loosen; fibrous; define it. Spell combing; hackling; through coarser; durable; coarse; hempen; wrapping-paper; oakum tarred; quantities; Russia. Where is Russia? Spell exported; Kentucky. Where is Kentucky? Spell countries; New England.

rags of them are used for making coarse wrapping-paper; the worn out parts of tarred ropes are picked into fine pieces, called oakum, and used for corking up the seams of vessels to make them water-tight.

Large quantities of hemp are raised in Russia, and exported to other countries. Hemp is also raised in Kentucky, and in several of the New England states.

## CAMPHOR, &c.

**Camphor** is a drug of the nature of a rosin. It has a strong, fragrant smell, and a bitter, pungent taste.

The camphor tree is a species of laurel that grows in the islands of Ceylon and Borneo, as well as other places. Some small parcels of camphor exude from the tree in the form of a gum; and considerable masses are sometimes found in the heart of some trees.

But the common method of obtaining it, is by boiling the roots and smaller branches, cut into small pieces, in large iron kettles. The camphor then rises on the top of the water, and is skimmed off and put into vessels to cool.

When refined, it is made into thin cakes of a very white colour.—In this state, or broken in pieces, it is sold to the merchants, and imported in chests, drums, or casks.

**Gamboge** is a resinous gum, of a beautiful yellow colour. It has no smell, and very little taste; yet it is used in medicine as a strong purgative.

It is chiefly brought from Cambogia, in the East Indies, whence its name has been derived.

**Gum Arabic** is the juice or gum that exudes from the acacia, or Egyptian thorn tree. It is brought from the Levant.

---

**Spell** camphor; rosin; fragrant; define it. Spell pungent; define it. Spell species; laurel; islands; Ceylon; parcels; exude; define it. Spell heart; method; boiling; smaller; branches; pieces; kettles; skimmed; colour; merchants; resinous; gamboge; beautiful; yellow; medicine; purgative; chiefly; Cambogia; whence; gum Arabic; exudes; acacia.

## OPIUM.

Opium is a drug that is used as a medicine, to allay pain and occasion sleep.

It is the white, milky juice which is obtained from the unripe seed-vessels of a species of poppy.

When the heads, or seed-vessels of the white poppy are nearly ripe, they are wounded or cut on one side, and the white juice flows out. The other side is cut in like manner the next day.

This juice being collected in a vessel, is exposed to the heat of the sun, which changes it to a dark brown colour, and gradually hardens it into a kind of gum which is called opium.

In this state it is worked on a board, and formed into cakes or rolls for sale.

Opium is of a bitter taste, and should be used with great care only as a medicine. When dissolved in brandy or alcohol, it forms a liquid called laudanum.

Another preparation, of which opium forms a part, is [illegible]led morphia.—Both this and laudanum are used for [illegible]posing the nerves, lulling pain, or producing sleep.

[illegible] many parts of Asia, whole fields are sown with poppy [illegible]s, as ours are with grain; and large quantities of opium a[illegible] procured from the heads.

---

**Spell** opium; medicine; allay; define it. Spell occasion; white; milky; juice; obtained; vessels; species; define it. Spell poppy; wounded; white; collected; exposed; colour; gradually; called; board; rolls; taste; should; medicine; dissolved; alcohol; liquid; laudanum; preparation; morphia; composing; producing; fields quantities; heads.

* * *

## THE NIGHT-HAWK.

This bird is about nine or ten inches long from the bill to the end of the tail. The feathers on the back and upper parts are of a dark-brown colour, mixed with a dusky white. The lower parts are lighter coloured.

The tail consists of ten broad feathers, and is forked; the wings are long and of variegated colours, as well as the tail.

The mouth of the night-hawk is very large; by which it is enabled to catch insects while flying. Its legs are short and its feet in proportion.

The female lays her eggs on the ground, without making any nest. She mostly chooses a dry place, where the colour of the grass, stones, and soil, nearly resemble the colour of her eggs.

She commonly lays but two eggs, of a dusky, bluish-white, marked with small spots of brown.

Towards evening, or from the middle of the afternoon until dusk, the night-hawks are to be seen flying high in the air, darting about in every direction, and making frequent and sudden turnings in pursuit of flies, beetles, and various other winged insects of the larger kinds.

Near the sea-shore, and in the vicinity of salt-marshes, they are also very numerous; often skimming over the fields and meadows, or flying high in the air, till it is so dark that the eye cannot follow them.

While the female is sitting on her eggs, which is called the time of incubation, the male is often seen flying about

---

Spell night-hawk; inches; feathers; colours; variegated; define it. Spell enabled; flying; proportion; eggs; chooses; resembles; soil; commonly; bluish; evening; afternoon; direction; frequent; pursuit; beetles; various; winged; vicinity; define it. Spell salt-marshes; numerous; skimming; fields; meadows; flying; female; sitting; incubation; define it. Spell often; frequently; harsh; noise;

in the air, most of the day. While on the wing, he frequently utters a sharp, harsh noise; and once in a while appears to dive or plunge down head foremost, making a loud noise somewhat like that of blowing into the bung-hole of a cask.

If any one approaches the nest, the female leaves it, and flutters or rolls along on the ground, as if crippled and unable to fly. She thus decoys the person away from her eggs or young ones, to a considerable distance, and then mounts on the wing high in the air, watching her nest until the danger appears to be over.

Several other birds that build their nests, or lay their eggs on the ground, have the same instinctive faculty of pretending to be lame or crippled, and thus leading the stranger, who comes near the nest, quite away from it in pursuit of the dam.

## THE PRISM-GLASS, AND COLOURS.

A PRISM-GLASS is a solid piece of clear glass, three or four inches long, having three sides, each of which is made perfectly smooth.

If we look at any distant object through this prism-glass, it will separate the rays of light, so as to show all the colours of the rainbow.

Hence, it is found that light consists of seven different coloured rays: the first is red; the second, orange; the third, yellow; the fourth, green; the fifth, blue; the sixth, indigo; and the seventh, violet.

---

while; plunge; head; foremost; somewhat; blowing: bung-hole; approaches; leaves; flutters; rolls; crippled; unable; decoys; define it. Spell considerable; distance; watching; until; appears; instinctive; build; faculty; pretending; stranger; pursuit.

SPELL prism-glass; piece; perfectly; smooth. What is a prism-glass? Spell through; colours; rainbow; yellow; indigo; blue;

When all these colours are properly mixed together, they constitute *white;* which is the colour of the light of the sun.

To prove this, take a spinning top, and paint it with all the above seven colours, in due order. On spinning the top, and while it is in rapid motion, it will appear to be all white; because the colours are mixed by its motion so that no one appears distinct.

Colours are different rays of light, reflected to the eye from different substances.

Some colours are formed by the mixture of other colours. Thus, green is composed of yellow and blue. Red and yellow mixed together, make orange. Blue and red form violet, purple, and lilac. Red, blue, and yellow, when properly mixed, produce olive.

When any substance reflects none of the rays of light, but absorbs them all, it is called *black.*

Light produces the sensation of vision, or sight, and is the cause of all colours, of every hue and shade. For, where there is no light, there is no distinction of colours; every thing is black, and all is darkness.

---

violet; mixture; constitute; spinning; rapid; define it. Spell distinct; reflected. Define reflected. Spell substance; mixture, orange; colours; together; blue; distinction.

## LOVE TRUTH: ABHOR LYING.

Innocent little children love truth better than falsehood. They feel a great deal more pleasure and interest in the hearing or reading of a thing, when they know it is true.

A fiction is a feigned story, often written or told as if it was a narrative of facts. Novels are mostly of this class of stories. They are works of imagination, and not a true relation of realities.

Amelia Opie, who wrote a book against lying, says, "An intention to deceive constitutes lying." She also says, "Those who withhold the truth or do not tell the whole truth with an intention to deceive, are guilty of lying, as well as those who tell a direct and positive falsehood."

When a wise man was asked, what a person could gain by telling a falsehood? he answered, "Not to be believed even when he spoke the truth."

In relating a story or anecdote, always keep to the truth, and never try to paint any circumstance beyond the reality. Many persons seem to delight in the marvellous, and therefore often exceed the simple truth, in order to gain applause: but this is not honest.

Never tell a falsehood in order to try to hide a fault. It is mean and wicked. But when we have done wrong, it is more noble to confess it at once, and ask forgiveness.

The scripture says, "Lying lips are abomination to the Lord; but they that deal truly are his delight."

---

Spell innocent; children; falsehood; pleasure; fiction; feigned; written; narrative; novels; imagination; realities; Amelia; wrote; intention; deceive; guilty; lying; positive; answered; believed. telling; anecdote; reality; marvellous; exceeds; forgiveness.

## SCULPTURE.

Sculpture is the art of carving, or cutting the figures and likeness of things out of stone, wood, or marble.

The person who acquires this art is called a sculptor.

A statue is a piece of sculpture, made in the form of a human being.

A bust is the upper part of a human figure, made of wood, marble, or plaster of Paris.

A bas-relief is when but little of the figure is raised above the surface or back-ground. The figures on coins, and those on stove-plates and other castings, are said to be in bas-relief, because raised but little above the surface.

It is also considered to belong to the art of sculpture, to make *casts* in plaster of Paris and bronze. These casts are taken from models, statues, busts, bas-reliefs, and the heads of persons, either living or dead.

To do this, a mold is first formed of some soft substance that will harden by drying or cooling. Plaster of Paris is often used for making this mold, by spreading it over the subject to be copied. When hard, the metal, plaster, or other substance is poured into the mold and forms a cast or bust.

Bronze is a kind of brass; being an alloy of copper and tin. It is also applied to any figure of men, beasts, urns, or other piece of sculpture which the ancients made of bronze.

A medal is an ancient coin, or piece of metal, stamped with some figure, portrait or device.

---

**Spell** sculpture; cutting; figures; acquires; define it. **Spell** sculptor; statue; plaster; bas-relief; surface; coins; castings; stove-plates; considered; bronze; models; statues; molds; drying; substance; often; spreading; copied; poured; alloy; copper.

## RUMINATING ANIMALS.

THOSE quadrupeds which chew the cud, are called ruminating animals.

These are generally patient and peaceful in their dispositions, and they feed on vegetables, grass, leaves of trees, and other verdure which is found in all parts of the world.

After their food has been once swallowed, they have the singular faculty of returning it back to the mouth, in small parcels, where it is again chewed at leisure, and again passes into the stomach for the nourishment of the animal. This is called ruminating, or chewing the cud.

For this order of animals, mankind are more largely indebted than for all the rest. Their flesh and milk supply a large portion of our food; and from almost every part of their bodies, we derive additions to our comforts in one way or another.

Their hides and skins are converted into leather and clothing; their horns are used for combs, cane-heads, knife-handles, and many other purposes. Even their bones, hair, fat, milk, and blood, are all useful to us in various ways.

Many of them are valuable as beasts of burden, to draw the plough, the wagon, the sledge, and other vehicles of conveyance; and afterward, when slaughtered, they supply wholesome food to the human family.

Animals of the cow kind, sheep, deer, rabbits, hares, goats, and others, are ruminating animals. They are to be found in all parts of the world.

---

SPELL ruminating; quadrupeds; define it. Spell generally; patient; dispositions; vegetables; verdure; swallowed; faculty; parcels; chewed; leisure; stomach; nourishment; chewing; cud; animals; indebted; portion; almost; bodies; additions; converted; define it. Spell leather; clothing; combs; knife-handles; valuable; plough; wagon; vehicles; conveyance; slaughtered.

## HATS.

**Hats**, or coverings for the head, are made of wool, the furs of moles, rabbits, beavers, otters, and some other animals; and also of the hair of camels and goats. Silk, cotton, and other substances are also used for the same purpose.

A wool or fur hat is neither spun nor woven, but consists of wool, hair, and fur, entangled or matted together until it becomes a clothy substance, called *felt*.

The wool, being cut into short lengths, is mixed with hair or fur, by beating it on a table with a bow. This process is called bowing.

When the materials are thus thoroughly mixed, so as to adhere together, the workman forms them into a batt. Two or more batts are then placed together, and hardened by tangling and matting the wool and hair till they become closely compacted together.

The next operation is called *planking;* that is, these batts or masses are laid on a plank, and worked in hot water for several hours, till they are completely fulled.

Some beaver or other fur is added; which, being very soft and glossy, forms an outside to the *felt*.

The hat is now in shape somewhat like a funnel; but, being placed on a round wooden block, to which it is pressed and shaped, it is at length brought to its proper form, with a crown and brim.

After being taken from the block and dried, it is ready for the dyer. This is done by boiling it in a dye-stuff

---

**Spell** coverings; rabbits; beavers; substances; neither; matted; entangled; lengths; materials; thoroughly; adhere; define it. Spell compacted; operation; completely; funnel; pressed; length; ready; dyer; boiling; copperas; stiffened; composition; glue; moistened; smoothed; heavy; appendages; colour; vegetable.

made of logwood and copperas. The hat is then stiffened with a composition made of glue and some other articles, applied to it with a brush.

The nap is then raised on the outside by the use of a hard brush dipped in soap and water.

The hat is again put on the block and brought into a perfect shape, by being moistened, brushed, and pressed or smoothed with a heavy hot iron.

The lining, binding, and other appendages being supplied, the hat is ready for sale or use.

Those called white hats are not dyed, but remain of the natural colour of the fur.

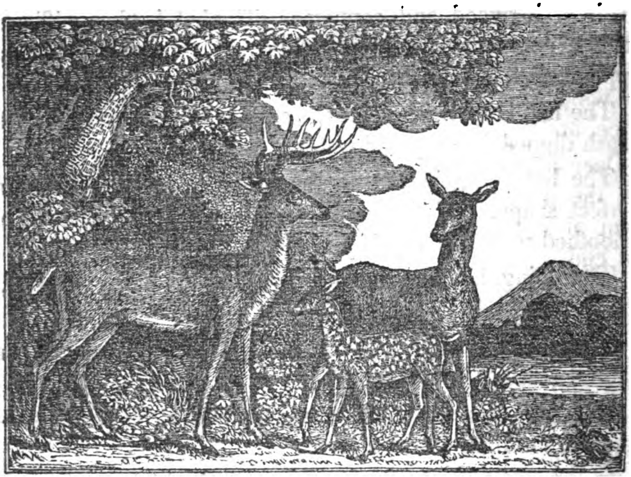
Hats are also made of straw, and other vegetable substances, for light summer wear.

In New England, many women and children are employed in braiding, or platting rye-straw, in order to be made into hats and bonnets.

These plats are sewed together, beginning with the centre of the crown, and working round and round till the hat is finished.

Many straw and chip hats are now woven by a kind of machine for that purpose.

Caps are made of the skins of some animals, dressed with the fur on; or of other stuffs.



## THE DEER.

Of all the four-footed animals that live in the forests, the deer are among the most innocent and peaceful. Their form may be called elegant; and the swiftness of their motion in flight seems to be their chief means of safety from their enemies.

Their limbs are slender and long; the neck is slim, and the head narrow and pointed toward the nose; the eyes are bright, large, and lively, and the ears long and open.

The colour of the deer varies in summer and winter; it may be called a reddish or brown gray, with the under side of the head, neck, body, and tail, nearly white.

The deer is a very shy, timid animal; but its senses of hearing and smelling are remarkably keen and quick; and on these its safety very much depends. A very slight

---

Spell forests; define it. Spell innocent; elegant; define it. Spell swiftness; chief; limbs; colour; deer; reddish; timid; define it. Spell senses; smelling; keen; remarkably; excites; approach.

noise excites its attention, and its fears are thereby quickly awakened. So acute is its power of smelling, that the hunter or any other enemy has to approach the deer against the wind, else he is discovered by the scent at a great distance, and it bounds away with speed.

Deer have no teeth in the front part of the upper jaw, but the gum is hard like that of cows and sheep. Like them also it is a ruminating animal, or one that chews the cud.

Deer are very nice and delicate in the choice of their food; which, in summer, consists of grass, green wheat, and the tender leaves or young shoots of various kinds of trees and shrubs. In winter, they feed on buds, and the tender soft twigs of shrubs, or some kinds of moss.

They mostly keep in herds or flocks, when feeding, and are led by one of the largest bucks, who appears to watch over their safety. If any noise or cause of alarm occurs, the leader stamps with his feet, and snorts so loud as to be heard a considerable distance; and when he runs, they all follow with a rapid flight.

Of the common deer, the male is called a stag, or buck, and the female, a doe. The stag or buck has two solid, branching horns, which are shed every year, about the beginning of winter; and young ones grow in their places. These young horns are at first covered with a soft skin, like velvet in appearance: but as they grow older, this skin at length dries up, the horns become very hard, and are larger and have more branching prongs than before. They are often called antlers.

The female deer, or doe, has commonly one or two young ones at a time, which are called fawns. They usually

---

scent; ruminating; chews; delicate; cud; shrubs; twigs; watch; noise; heard; considerable; rapid; solid; branching; beginning; velvet; appearance; length; antlers; young; fawns; usually;

come in the spring, and are mostly of a light cinnamon colour, spotted with white. The doe carefully conceals her young fawns, while she goes out to feed; and is so very fond of them that she seems to lose all care for her own safety, when they are in danger from an enemy.

In the latter part of summer, the fawns lose their white spots, and gradually become of a reddish-gray colour. A young fawn is a beautiful, innocent little animal; and, if taken from its dam, it may easily be tamed. It is gentle as a lamb, and soon becomes very much attached to its keeper and feeder. But such pets are often more trouble and expense than profit; for, as they grow larger, they leap over fences, intrude into the house, and eat the leaves and twigs of young trees and shrubbery, or get into the garden and fields, and spoil the corn, plants, and flowers.

The flesh of the deer is called venison, and is an excellent article of wholesome food, when killed in the proper season, which is autumn. The horns of the buck are worked into knife-handles, cane-heads, and other useful articles: and the skins of the deer, when tanned and properly dressed, are used for making gloves, mittens, shoes, and for other valuable purposes.

The deer inhabit the woods and forests from Canada, through all the United States, and the northern parts of Mexico. The moose, the elk, the black-tailed deer, and the rein-deer, are all considered to be species of the American deer.

---

**cinnamon; colour; spotted; conceals; gradually; reddish; innocent; beautiful; attached; expense; shrubbery; fields; venison; excellent; wholesome; autumn; knife-handles; tanned; shoes; valuable; purposes; lamb; trouble; inhabit; forests; Canada; Mexico; rein-deer; moose; species; define it. Spell mittens; fences; fields; beautiful.**

## ADDRESS TO A WILD DEER,

*Supposed to have strayed from the woods and wandered among the settlements of men.*

Why didst thou leave thy native woods,
  Deer of the forest, here to roam?
And quit the murmur of the floods,
  And rivers of thy mountain home?
Why didst thou thus resign the glen,
To die among the abodes of men?

There's freedom on the rocks and hills,
  A liberty that nature gives;
Which animates, inspires, and fills
  The heart of every thing that lives;
And seems to give a nobler air
To every form that wanders there.

Yes, ev'n the very trees that rear
  Their branches in the summer sky,
In their wind-shaken leaves appear
  To manifest their majesty;
And raise their heads as though they felt
They grew in scenes where nature dwelt.

There, thou couldst lift thy antler'd brow,
  And pace the wilds in conscious pride,
Or climb the steeps where wild-flowers grow,
  Or plunge within the torrent's tide;
Being free alike to scale or swim,
With glancing eye and untired limb.

The crags and peaks were all thine own,
  The rivers and the rocks were thine;

---

**Spell** strayed; define it. Spell murmur; resign; animates wanders; majesty; antlered; conscious; define it. Spell climb

Free as a monarch on his throne,
  To mount the cliffs where sunbeams shine.
A monarch of the woods wast thou,
And chief among the antler'd brow.

Along the misty valley's shade,
  Thy footsteps roam'd at break of morn;
The echoes of thy native glade,
  Ne'er heard the clang of hound or horn:
The blackbird's note, the wolf's loud bay,
Were all that met thee on thy way.

Wild nature was around thee there,
  In all its rich romantic grace,
It seem'd as though the very air
  Partook the nature of the place
Whate'er it was in other eyes,
To thee it seem'd a paradise.

Then why didst thou forsake those wilds,
  Amid the haunts of men to stray?
The rocks that on thy hills are piled,
  Are not more hard, more bleak than they.
Why didst thou come from freedom's sky,
By human hands at last to die?

---

torrent; monarch; define it. Spell chief; valley; footsteps; echoes; blackbird; romantic; define it. Spell whatever; haunts; define it. Spell bleak; deer; couldst; scenes; wolf; branches; paradise.

## GRATITUDE.

A PRESENT was made by a person to a little child who had just learned to talk. On being asked by its mother what it had to say for it, the child replied, "I love thee."

This was the simple feeling of gratitude for the favour received. Love to the benefactor arises from a sense of the kindness that has been conferred. This expands the heart with thankfulness and affection towards the donor.

Gratitude also includes a due and thankful remembrance of benefits received, and a desire to make some return for the favour.

If gratitude is due from man to his fellow man for benefits and kindnesses received, how much more from man to his Maker!

When we consider that the Supreme Being does not only confer upon us those gifts and blessings which proceed immediately from his own hand, but also those benefits and kind actions which we receive from our fellow-creatures, there is a double cause of gratitude.

Every blessing and real good that we enjoy, by whatever means it may be conferred upon us, should be considered as the gift of Him who is the great Author of all good, and the Father of mercies.

It is He that has given us every good that we already possess; and it is from Him that we expect to receive every blessing that we yet hope for.

When we consider that the favours of Heaven are wholly disinterested, that our Almighty Benefactor aims at no end

---

•SPELL learned; replied; gratitude; received; benefactor; sense; confined; donor; remembrance; benefits; fellow; kindnesses; supreme; immediately; receive; creatures; proceed; whatever; double; should; author; mercies; already; favours; disinterested; wholly; almighty; benefactor; aims; devout; obedient; obligation;

but the happiness of those whom he blesses, and that he requires no return from them but a devout, obedient, and thankful heart, how strong is the obligation of love and gratitude to the supreme Fountain of all goodness!

Hence, gratitude is not only a pleasing, and a delightful feeling of the mind,—but it is attended with so much inward satisfaction and happiness, that the duty is fully rewarded by the performance of it.

When the Psalmist was recounting the favours and blessings received from the Almighty Father, his mind expanded in humble gratitude, so that he exclaimed, "What shall I render unto the Lord for all his benefits toward me!"

Let gratitude in acts of goodness flow,
Our love to God, in love to man below.

## MISCELLANEOUS SUBJECTS.

An amphibious animal is one that can live both on land, in the air, and also in the water. Of this kind are frogs, beavers, seals, and some other animals.

The silk line, as spun by the silkworm in forming its cocoon, is about the five-thousandth part of an inch in thickness; but a spider's web is said to be about six times finer; that is, only the thirty-thousandth part of an inch in diameter.

Raisins are grapes dried in the sunshine, or in ovens. The greatest part of those brought from Turkey and Spain are said to be dried in ovens; but those dried in the sun have a finer flavour and better taste.

---

define it. Spell satisfaction; rewarded; define it. Spell psalmist; performance; expanded; define it. Spell exclaimed; define it. Spell toward; gratitude. What is gratitude?

Spell amphibious; beavers; silkworm; cocoon; thousandth; diameter; define it. Spell raisins. What are raisins? Spell ovens; Turkey; flavour; define it. Spell orbit; define it Spell luminary

The orbit of a planet is the path or course in which it moves round the sun, at a nearer or greater distance from that luminary.

Cows, sheep, and deer have no teeth in the front part of the upper jaw. They have two stomachs, and chew the cud; they are called ruminating animals.

That part of science which treats of the nature and properties of light, and also of vision or seeing, is called optics.

Carbonic-acid gas has produced many fatal accidents on human life, at the opening of cellars and vaults, in which wine, cider, or beer has been suffered to ferment. This gas is sometimes found in wells, and men should not go into them without first letting down a lighted candle. If the candle burns bright, it may be safe to descend; but not otherwise.

Spirits of turpentine is produced by distilling, with water, the resinous juice or sap of several species of pine trees. When mixed with paints, it causes them to dry more rapidly.

It should always be kept in view by medical men, that their true province is to preserve, as well as restore the health of those who intrust themselves and their families to their care.

How extremely small must be the particles of musk, when a single grain of it has been known to perfume a large room for the space of twenty years!

In the Bible we are told, that to "Fear God and keep his commandments is the whole duty of man."

Again, it is said in the Bible, that God "hath showed

---

stomachs; chew; ruminating; define it. Spell optics; science; carbonic; acid; define it. Spell cellars; accidents; descend; turpentine; distilling; resinous; species; define it. Spell medical; health; extremely; showed; structure; displays; perceive; colour, position; surround; vitriol; azure.

thee, O man, what is good: and what doth the Lord require of thee, but to do justly, and to love mercy, and to walk humbly with thy God?"

The structure or form of the skin is composed of three layers, and, like every other part of the animal frame, displays very striking proofs of the wisdom and goodness of the great Creator.

Sight is the sense by which we perceive the form, colour, size, and position of objects that surround us.

A single grain of blue vitriol, or sulphate of copper, will give a fine azure tint to five gallons of water.

## READING, SPEAKING, AND WRITING, SHOULD BE CLEAR AND DISTINCT.

The first care and attention of every person who reads or speaks to others, should be to make himself be heard by all those to whom he reads or speaks.

In order to be well heard by all the company, it is a useful rule, when we are about to begin to read or speak to others, to cast our eye on some of the most distant persons present, and to consider ourselves as speaking or reading to them. This will induce us to raise our voice loud enough for them to hear us; and then all who are nearer to us will be likely to hear distinctly.

Every body, when calling or speaking to a person at a distance, naturally raises his voice so loud that the person may hear him; for it is not worth while to speak, if we are not heard.

Some people, in common conversation, get into a habit of speaking so low, as if with their mouths almost shut

---

SPELL attention; should; heard; company; eye; ourselves; reading; distinctly; understood; writing; convey; ideas; difficult; scrawling; lawyers; business; error; especially; frequently;

close, that it is very difficult to understand all they say; and it is painful to be under the necessity of frequently asking them to repeat their words.

As the object of speaking or reading to others, is to be clearly understood by the hearers, so the object of written language is to convey clear ideas to others, by writing. All writings that are intended for others to read, should therefore be so plain and distinct that they may be easily read and understood.

Yet how many there are who, through a careless habit, write a scrawling running-hand that is very difficult to be read or understood!

Lawyers and business-men often fall into this error; especially in writing their own names, which are frequently so contracted or obscure that a stranger cannot read them at all.

Bank-notes and other important papers, are often signed by cashiers and other officers, in a manner which is not intelligible to a stranger.

Many mistakes and difficulties might be avoided, by acquiring a habit of writing a plain hand; and especially by making figures plain and distinct, as well as by writing and signing names in full, with a clear hand.

A lawyer once wrote a letter to his friend on business; but his friend could not read it: he therefore sent it back for explanation, when, behold! the lawyer could not read his own hand-writing.

A business-man professed to sign his name to a letter of importance which he wrote to a stranger. The letter required an answer; but he that received it could not read the name of the writer, and therefore did not know to whom he should direct the answer.

---

**signed; cashier; intelligible; necessity; enough; stranger; difficulties; acquiring; figures; signing; business; explanation; requiring; received; writer; answer; people; conversation.**

## GLASS.

Glass is made of pure sand, called silex, with a proper quantity of soda, or potash. These being mixed together, are exposed to a violent heat, until they become melted into a fluid mass.

The process of forming this melted matter into various kinds of glass, is called *blowing*. This is done by dipping one end of a long, hollow, iron tube, into the melted glass, some of which sticks to the end of the tube.

The workman then puts his mouth to the other end of the tube, and blows; the hot fluid glass then swells out at the end of the tube, like a bladder when it is blown; and the more it swells in size, the thinner it becomes.

During this operation, it is frequently rolled on a flat, smooth piece of iron, or marble, in order to shape or polish it.

If a common bottle or vial is to be made, the melted matter at the end of the tube is put within a mold of the exact shape and size of the body of the bottle or vial, and his blowing forces the fluid glass into the full size of the mold. The neck and mouth are then formed on the outside, with a piece of iron, by drawing out and shaping the ductile glass.

If a goblet, or vessel with a large or wide opening, is to be formed, the workman spreads the melted glass with an iron tool, and wheels his tube round, which makes the glass fly open into the shape wanted.

To make window-glass, he dips the iron tube several times into the melted glass so as to take up a sufficient quantity, and then blows till it becomes a cylinder of large

---

Spell silex; define it. Spell quantity; potash; exposed; violent; fluid; blowing; dipping; hollow; operation; rolled; thinner; iron; smooth; mold; forces; outside; piece; ductile; define it. Spell spreads; window; cylinder; scissors; gradually; which; diamond;

size. This, being cut open my means of scissors or shears, is gradually bent back, till it becomes a thin flat plate, which is cut into panes of glass with a diamond, to the size that is wanted.

Large plate-glass for mirrors, or looking-glasses, is made by pouring the melted glass, taken hot from the furnace, upon a smooth casting-table which has ledges at the sides to contain it. In order to make it of an even thickness and perfectly flat, a large heavy metallic roller is passed over it while cooling.

When cold, these glass plates are ground on both sides with fine sand, and polished with emery and putty. After which, a thin coat of quicksilver mixed with tin-foil is fixed on the back, and thus looking-glasses are made.

Though glass, when cold, is very brittle and easily broken, it is, when in a melted state, one of the most ductile bodies known. It may be drawn out into threads, when red-hot, so fine as scarcely to be visible to the naked eye. It can also be formed into various kinds of toys, and imitations of ships, horses, dogs, birds, and other animals.

Glass utensils, after they are first blown or formed, require to be heated again, and gradually cooled in an oven. This operation is called annealing, and prevents their cracking with hot water, or in wiping, or with any slight stroke.

Handles, spouts, knobs, feet, and any thing else that is to be added to vessels, are made separately, and stuck on while in a melted state.

What is called cut-glass, is made so by grinding. The glass to be cut is held against a sharp wheel, which is

---

wanted; mirrors; looking-glasses; pouring; furnace; perfectly; ledges; heavy; metallic; rollers; polished; emery; quicksilver; easily; ductile; threads; visible; utensils; annealing; separately; knobs; else; rapidly; moving; beautiful; angles; squares; figures decanters; glasses; polished; variety; glittering; colours; mixing fluid; various; metallic; oxides; metals.

turned round very rapidly. By moving the glass, the beautiful shapes, knobs, angles, squares, and other figures on wine-glasses, decanters, and other glass-ware, are formed and polished, so as to show a variety of shades and glittering colours.

Glass is often coloured by mixing with it, while in a fluid state, various metallic oxides, or rust of metals.

---

## GEOGRAPHY.

**Geography** is a description of the surface of the earth, as composed of land and water.

A geographer is a person who describes the earth, and forms a map according to the position of its different parts.

A map is drawn on paper to show the shape or figure of any particular country, or part of the surface of the earth, with its seas, lakes, and rivers.

The upper part of a map is mostly made to represent the northern parts, and the bottom, the southern parts of the country intended to be described.

If we look toward the north, the east will be on our right hand, and the west on the left; so it is in maps.

---

**Spell** geography; description; surface; geographer; describes; position; drawn; figure; particular; country; represent; northern;

Rivers and streams of water are marked on maps by dark, crooked lines, growing larger as they approach the sea or ocean.

The earth is divided into four great divisions, sometimes called quarters of the globe. These are, America, Europe, Asia, and Africa.—And these are again divided into kingdoms, countries, provinces—states, and territories.

The land is also divided into continents, islands, capes, and peninsulas; as the continent of America, Long Island, Cape May.

A continent is a very large tract of land, containing many states, kingdoms, or provinces. An island is a smaller portion of land, surrounded by water.

When part of a continent or island runs out into the sea and ends in a point, it is called a cape: A peninsula is a part of any country that is almost surrounded with water, but connected with the main land by a narrow strip, called a neck or isthmus.

The waters are divided into oceans, seas, bays, lakes, and rivers. A very large extent of water is called an ocean; as, the Atlantic ocean, the Pacific ocean.

A smaller collection of water, nearly surrounded by land, is called a sea; as, the Mediterranean sea.

A lake is a body of fresh water, enclosed by land on all sides; as Lake Erie, Lake Ontario.

A bay is a portion of the great ocean, or of a sea or lake, which seems to run into the land; or to be the mouth of a river; as, Hudson's Bay, Delaware Bay.

A river is a large stream of water, passing through a country, and emptying into another river, lake, or sea.

---

**southern; approach; ocean; divisions; quarters; America; Asia; Europe; territories; continents; islands; peninsulas; containing; provinces; smaller; surrounded; connected; called; isthmus; Atlantic; divided; enclosed; Erie; Ontario; portion; Delaware; stream; emptying; another.**

## DIALOGUE BETWEEN A MOTHER AND HER CHILD.

CHILD.

I SAW the glorious sun arise
  From yonder mountain gray;
And as he travell'd through the skies,
  The darkness fled away;
And all around me was so bright,
I wished it always would be light.

But when his shining course was done,
  The gentle moon drew nigh;
The stars came twinkling, one by one,
  Upon the shady sky.
Who made the sun to shine so fair,
The moon and every twinkling star?

MOTHER.

'Twas God—my child, who made them all,
  By his Almighty hand;
He holds them that they do not fall,
  And bids them move or stand.

CHILD.

How very great that God must be,
  Who holds them in the air;
Too high, I fear, to notice me,
  Or listen to my prayer.
And will he surely condescend
To be a little infant's friend?

MOTHER.

O yes, my love: for though he made
  Those wonders in the sky,

---

Spell glorious; yonder; mountain; travelled; through; course; skies; drew; twinkling; almighty; notice; listen; prayer; though; condescend; wonders; daisy; flutter; insect; supplies; always; darling; reigns; above.

Thou never need to be afraid
He will neglect thy cry:
For little as a child may be,
A praying child he loves to see.

Behold the daisy where we tread,
That little tender thing,—
Behold the insects over head,
That flutter in the spring!—
His goodness makes the daisy rise,
And every insect's wants supplies.

He makes the little child his care,
He sees it day and night;
He hears its little infant prayer,
'Tis always in his sight.
Then let my darling always love
The God who rules and reigns above.

## GOOD NEIGHBOURS.

SOLOMON says, A man that would have friends, must show himself friendly. To which may be added, If a man would have kind and good neighbours, he must be kind and neighbourly himself.

To do unto others as we would have others do to us, will go far towards the harmony and peace of neighbours. Some rules or precepts like those which follow may also be useful.

If you have occasion to borrow any thing of a neighbour, take care always to return it as soon as you have done with it, and acknowledge the favour.

---

SPELL Solomon; friends; friendly; neighbours; towards; harmony; precepts; useful; occasion; borrow; acknowledge; owners valuable; attention; injury; accidental; borrowed; repaired; condition; otherwise; compensation; trespass; poultry; injuring; neighbour.

Many books and valuable articles have been lost to the owners, for want of attention to this rule, of doing as you would be done by.

If any injury or accidental damage should happen to a borrowed article, let it be repaired so as to be returned to the owner in as good condition as it was when borrowed; otherwise acknowledge the defect, and offer compensation.

Always keep good line-fences, so that your pigs, cattle, and other things, may not trespass on your neighbour's grounds.

Let your poultry be kept up, or otherwise be prevented from injuring your neighbour's garden, corn, or other crops.

## INDIGO, &c.

Indigo is a plant that grows about two feet high. It requires a light, rich soil in a warm climate. The seeds, which look like gunpowder as to size and colour, are sown or planted in furrows, about a foot apart. The leaves of the plant are green, and the blossoms of a reddish colour, resembling pea-blossoms.

In about six weeks or two months after the seeds have been sown, the crop is ready for cutting.

The indigo plants are then placed in layers, in a large wooden vat, and covered with water.

In this state they soon ferment, and the water or fluid part appears green, but changes to blue.

It is then drawn off into another vat, and stirred until the colouring matter unites in one body.

The water being then drawn off, the blue sediment remains, which, when dried, is formed into small lumps or

---

Spell indigo; climate; define it. Spell gunpowder; furrows; leaves; resembling; blossoms; layers; wooden; ferment; define it little square cakes, and put up ready for sale. The best indigo is of a dark, shining blue, and is used for dyeing.

Indigo is raised in the southern states; but far the greater portion of what is used, is imported from the British East Indies.

Cochineal, which is used in dyeing scarlet, crimson, and other bright colours, is an insect, seldom larger than the size of a grain of barley.

The cochineal insects are reared with care; and at a proper time of their growth, they are put into boxes well lined with coarse cloth. In this confinement, they lay their eggs, and then die. When thoroughly dried, they are put up in bags, and form an article of commerce.

Cochineal is found in Mexico, Georgia, and some of the West India islands.

Madder is the root of a plant, and is used in dyeing a red colour. It grows in the south of Europe and in India.

## WHY THE SUN APPEARS LARGER AT SUNRISE AND SUNSET.

Some little children, and some larger grown persons, inquire why the sun and moon appear so much larger when just rising or setting, than when they are a few hours high, or at noon.

To answer and explain this question, we must consider that the air or atmosphere is more compact and close near the surface of the earth, than it is higher up. This is called the density of the atmosphere.

---

Spell fluid; stirred; colouring; sediment; define it. Spell dyeing; imported; define it. Spell cochineal; crimson; barley; reared; growth; thoroughly; commerce; islands.

Spell children; grown; answer; explain; question; atmosphere.

The reason of this density of the air near the earth, is because the upper parts of the atmosphere press upon the lower, somewhat like a pile of loose cotton or wool. When a large quantity of these or other light substances is heaped on, the weight of the upper part presses the bottom or lower part closer together, and it becomes more compact. So it is with the air or atmosphere; and while the lower part is dense or compact, the upper part is rare or thin.

Now, when we look at any thing through a dense medium, it appears larger than when it is seen through a rare or thin medium. But we see the sun and moon, when rising or setting, through the dense part of the atmosphere that is next and near to the surface of the earth, and therefore they appear larger than when they are seen nearer perpendicular, through a rarer medium.

To prove this, let a ten-cent piece be put into a cask full of clear water. It will sink to the bottom, and then appear to be larger than when seen in the air. The reason is, because water is a denser medium than air.

The water in some of the lakes is so clear and transparent, that the bottom may be seen fifteen or twenty feet deep. In one of these lakes, an Indian was induced to dive to the bottom, in order to get a quarter of a dollar which some person threw into the water, promising to give him the money if he would bring it up. The Indian, not seeing the piece before it was thrown in, thought it was a dollar, it appeared so large. The reason of its appearing so large was, that it was seen through the dense medium of the water, which magnified it.

---

surface; higher; density; compact; somewhat; quantity; weight; substances; bottom; through; dense; define it. Spell medium; nearer; perpendicular; define it. Spell piece; reason; because; denser; define it. Spell transparent; define it. Spell fifteen; twenty; Indian; quarter; dollar; threw; promising; thrown; thought; appeared; magnified; define it. Spell atmosphere; define it. Spell balloon; distance; ground; size; sight.

In like manner, the dense atmosphere may be said to magnify the sun and moon when rising or setting, because they are seen through a great distance of dense air.

So a man, a house, a balloon, or a bird, a mile or two from us, on or near the ground appears nearly of full size. But a balloon, or a bird, or a boy's kite, when a mile or more high in the air, and nearly over our heads, would appear very small and almost out of sight.

## SHORT ACCOUNT OF WILLIAM PENN.

William Penn was born in London, in the year 1644, about two hundred years ago. His father's name was William Penn, an admiral in the British navy.

When William Penn was about fifteen years old, he was sent to Oxford college, that he might be educated for the practice of the law. But his mind became impressed with serious thoughts, and he chose rather to renounce the vanities and greatness of the world, in order that he might enjoy peace with his heavenly Father.

In the twenty-second year of his age, he became a member of the religious society of Friends; and about two years after, he appeared in the station of a minister of the gospel.

He suffered much on account of his religious opinions, being several times thrown into prison for attending meetings, and preaching to the people.

But while he was confined in prison, he was not idle. He wrote much on religious and civil subjects. One of his books, called "No Cross, No Crown," is an excellent work, and worthy of being read by all classes of people.

---

**Spell** William Penn; admiral; college. What is a college? Spell educated; impressed; renounce; define it. Spell religious; society; thrown; preaching; people; civil; excellent; judgment; intimate; knowledge; government; history; country; petition; portion.

William Penn was a man of sound judgment, both in religious and civil matters. He had also an intimate knowledge of the laws, government, and history of the country in which he lived.

In the year 1680, he presented a petition to the king of England, asking for the grant of a portion of land on the western side of the river Delaware. In the next year his request was granted, and he became the proprietor of the state of Pennsylvania.

William Penn, however, did not think that this grant from the king could give him a just and full right to the soil. He therefore made a treaty with the Indians, and purchased the land of them also.

So mild and gentle were the manners of William Penn, and so open, upright, and honest was his conduct toward the Indian natives, that he gained their entire confidence and esteem.

A great many people in England bought land of William Penn, and crossed the Atlantic ocean with their families, to settle in this wilderness country; where they might enjoy their religion, and worship their Creator according to the dictates of Truth in their minds, without being persecuted or cast into prison for it.

But many of the early settlers in Pennsylvania would have suffered greatly, had it not been for the kindness of the Indians in supplying them with food, and assisting them in settling in the woods.

In forming a code of laws for the government of his colony, William Penn had special regard to that liberty of conscience, which he considered the natural right of all men.

---

**Delaware; proprietor; define it. Spell Pennsylvania; however; treaty; Indians; purchased; honest; their; confidence; England; brought; Atlantic; ocean; religion; dictates; persecuted; settlers; supplying; assisting; settling; government; colony. What is a colony? Spell special; conscience; considered; adapted; define it.**

He therefore wisely adapted his laws to promote the happiness, peace, and prosperity of the people who might come to settle in the province.

In person, William Penn was tall and athletic; and he was said to have been a fine looking, portly man.

He possessed great sweetness and meekness of temper, and a native energy of mind, improved by religious principle. But the great rule of his life and conduct was the fear of God, and the love of truth and justice.

This sense of religion and moral rectitude was embraced by him in early life; and by it he was taught to judge of things according to their real value. This conferred on him a dignity and nobility, beyond the power of kings or of wealth to bestow.

He was truly a great man; yet his greatness consisted not in show and splendour, but in his humility, wisdom, goodness, and beneficence.

He died in the year 1718, aged about seventy-four years.

## PROCESS OF MAKING PINS.

Pins are made of brass, drawn out into wire. To make wire, a bar of metal is drawn through a hole in an iron or steel plate, which is rather too small for it: but being drawn through with great force, it becomes smaller. It is then drawn through holes smaller and smaller, until it becomes wire of the size wanted.

In the first place, the brass wire of which pins are made, is rendered quite straight. It is then cut into proper lengths of four, five, or six inches, so as to make six pins of each.

---

Spell prosperity; province; athletic; define it. Spell portly; possessed; sweetness; energy; define it. Spell religious; principle sense; moral; rectitude; embraced; taught; value; conferred, dignity. Define dignity. Spell nobility; wealth; consisted; splendour· humility; beneficence. What is beneficence?

These lengths are first pointed or sharpened at each end. This is done by children, with each a couple of grindstones before him,—one coarse and the other fine; and they are turned by a wheel.

A boy takes up a handful of these lengths of wire, and applies their ends to the coarse and then to the fine grindstone, turning them round at the same time. This is done so rapidly, that it is said one boy can point sixteen thousand pins in an hour.

The length of a pin is then taken off each end of these pieces of wire, and the remaining ends are ground again to points; and so on till the wire is used up.

Being thus pointed, the pins are next to receive the head; which is formed in the following manner.

Round a straight wire, the size of the pins, another wire is wound or twisted by means of a wheel, for some length, till it has the form of a little brass cylinder. Then the straight wire is drawn out, and the twisted part is hollow, like a spiral coil or cylinder.

This spiral cylinder is then cut into small bits, each containing two twists, which are to form the pin heads.

After being heated red hot in order to soften them, when cool, a heap of them is placed in a dish before each of the children who are to head the pins.

Each of the children being furnished with a machine for fastening on the head, these bits are taken up one at a time on the end of the pins, and by the force of the machine made to adhere closely to them, in a smooth round form.

All this is done with a motion so quick, that a spectator can hardly count the number of pins headed by one person.

---

**Spell** process; drawn; metal; smaller; rendered; straight lengths; pointed; sharpened; couple; grindstone; coarse; wheel; applies; rapidly; sixteen; pieces: remaining; points; following;

The pins are now made, but they are only yellow brass. The next process is to give them whiteness. This is done by putting them into a solution of tin prepared with the lees of wine. By a chemical operation, the tin soon adheres to the brass, and gives the pins a white appearance.

They are then polished, by putting large numbers of them into a vessel with a quantity of bran. The vessel being turned round with a quick motion, the pins are thus rubbed, till they are perfectly bright.

Last of all, they are stuck in rows upon the pin-papers, with neatness, so many in a row, in regular order. They are then ready for sale.

Much of these operations is done by children, and they acquire a habit of doing it with amazing dexterity. But as each one attends only to one part of the business, so the making of every pin has to pass through many hands, before it is ready for use.

Some modern improvements have been made in the process of making pins; particularly in making heads out of the same wire as the body of the pin.

---

receive; size; twisted; cylinder; define it. Spell spiral; coil, containing; twists; which; soften; placed; children; furnished; machine; fastening; adhere; define it. Spell smooth; motion; spectator; define it. Spell headed; yellow; whiteness; putting; solution; define it. Spell chemical; operation; adheres; define it. Spell appearance; polished; vessel; quantity; perfectly; bright; neatness; regular; acquire; define it. Spell amazing; dexterity; define it. Spell business; ready; modern; define it. Spell particularly; improvements.

## ON PEACE AND WAR.

A LITTLE boy was once asked if he knew the reason why every body loved him. He said he did not know, unless it was because he loved every body.

When we love every body, we feel much more happy than when we feel anger or hatred towards any one.

Love produces good will and kindness towards others, and promotes the happiness and comfort of others as well as our own.

Love is the root and spring of all true and real happiness in this life and in that which is to come: for love is of God, and God is love.

But wrath and hatred make people unhappy, and produce abundance of evil in the world.

Every feeling, and every desire or action that is contrary to love, is evil, and tends to misery and unhappiness.

Pride and a selfish spirit are the root and source of anger, strife, envy, hatred, and contention.

Hence anger, hatred, envy, malice, cruelty, and revenge, are all ungodly and wicked, because they are opposite to love, peace, and good will.

From whence arise quarrels, disputes and wars? They do not proceed from love and good feelings. Do they not come from the evil root of selfishness, improper desires and lusts, pride, and ungoverned passions?

Let these be subdued and restrained, and quarrels, wars, and fightings will cease, with all their unhappy effects and dreadful consequences.

To minds that delight to dwell under the happy influence

---

SPELL knew; every; produces; wrath; unhappy; abundance, malice; opposite; source; contention; quarrels; selfishness; ungoverned; subdued; restrained; consequences; influence; soldiers;

of love, and peace and good-will to all, an army of soldiers, or a military parade presents a painful sight. Because it is connected with the shocking ideas of destroying human life, and increasing the miseries and sufferings of mankind.

War is contrary to the precepts and spirit of the gospel.

When correctly viewed, war is equally the disgrace and the scourge of nations. It shortens human life, and lessens the number and kind of enjoyments in the human family.

Between peace and war there is no comparison of advantages. Peace leads to prosperity and happiness, while war tends to misery and destruction.

It is time that the nations of the earth had rest from the miseries and calamities of war. It is time that children and youth were taught that they are born for other and far more noble purposes, than the shedding of human blood.

As human life is given by God alone, he only has a right to take it away.

No pen or pencil can draw in its true colours the portrait of war. It is all extreme,—all horrible,—all wicked.

It is a shocking sight to a feeling mind, to see two men quarrel and fight. But when a great many thousands on each side of a battle meet for the purpose of killing each other,—when hundreds of men are dashed in pieces by cannon-balls and bomb-shells,—or shot down with bullets and grape-shot,—cut and slashed with swords, or stabbed with bayonets, or crushed by carriages and trampled by horses,—rushing on one another with horrid curses and murderous fury, amidst the groans and cries of the wounded and dying,—such a scene of battle must present a spectacle of shocking carnage, slaughter, and misery, which neither tongue, pen, nor pencil can reach or describe.

---

**military; ideas; destroying; increasing; precepts; viewed; scourge; lessens; enjoyments; comparison; advantages; prosperity; nations; destruction; calamities; taught; purposes; shedding; colours;**

But further, on the field of battle, the wounded, the dying, and the dead, are left mingled together. Many whose limbs and bodies are torn, mangled, and cut to pieces, with ghastly wounds, endure pains and torments which none can conceive, and lie neglected, writhing, and bleeding to death, for hours, and sometimes for days,—till they perish with slow and lingering tortures and agonies.

But one of the armies, with its generals, is said to be victorious, and to come off conquerors. Then, the flying of colours and banners, and the ringing of bells, with other tokens of rejoicing for conquest, are had on one side,—while on the other, the feelings of anguish, grief, and sorrow, rend those families who read the mournful list of fathers, brothers, husbands, and children, slain and fallen in battle.

The history of wars and battles is often drawn up in the language of conquest and glory; and purposely painted in colours to excite the wonder and applause of children and youth. The exploits of heroes and generals in the destruction of human life, are held up to view as acts of merit and of valour that attract the admiration of the reader—instead of an abhorrence of the crimes, and cruelties, and miseries, and destructive effects of war.

Tales and pictures, and histories of wars and bloodshed, of fraud, and violence, and cruelty, are therefore improper to be put into the hands of children; unless the evils, and wickedness, and mischiefs of war, and the characters and exploits of warriors are held up to view in their true

---

pencil; portrait; extreme; horrible; quarrel; pieces; cannon; bomb-shells; swords; stabbed; bayonets; carriages; trampled; murderous; groans; cries; scene; spectacle; carnage; define it. Spell slaughter; tongue; pencil; describe; dying; limbs; ghastly; conceive; neglected; writhing; tortures; agonies; victorious; conquerors; flying; rejoicing; conquest; anguish; grief; families; history; drawn; language; purposely; applause; exploits; heroes; valour; admiration: abhorrence; histories; mischiefs; characters; warriors; exciting; heroism; sympathy; horror; cruelty; miseries ignorance.

colours, as being contrary to the spirit and temper of the gospel of peace and love.

Thus, instead of exciting admiration and applause, the bravery, heroism, and exploits of warriors, should produce in the human mind the feelings of horror and disgust, of pity and sympathy, on account of the ignorance, the cruelty, the crimes, and the miseries of war.

## DESCRIPTION OF A COPPER-MINE IN CORNWALL, ENGLAND.

THE descent into the mine was down a shaft, by means of ladders. A shaft is a hole made by digging and blasting, like a well.

At the end of each ladder is a resting-place, formed by a piece of timber or plank, fixed across the shaft, and let into the stones or earth which are at its sides.

With each a lighted candle, so held by the thumb and fore-finger of the left hand, as to leave the other three fingers at liberty to grasp the rounds of the ladder, and the right hand applied to the same service, the descent was commenced.

The labour and hazard of going down these ladders four hundred feet, were very great; for the rounds of the ladders were wet and muddy, and therefore very slippery.

Having arrived at the depth of four hundred feet, we came to what the miners call an *adit*, or level; that is, a passage running in a horizontal direction, or at right angles with the shaft.

This passage had been made through the solid rock, and was high enough to allow us to pass along with stooping

---

SPELL description; England; descent; digging; piece; fingers liberty; applied; commenced; hazard; slippery; arrived; depth running; horizontal; direction; passage; enough; stooping; varies which we did for some distance; when the sound of human voices from below reached our ears.

We also heard the noise of tools which were used in breaking off the ore; and the report of an explosion of powder in blasting the rocks, echoed along these narrow caverns with a loud noise, and strong smell of sulphur and smoke.

We went along this narrow level way, till we came to another shaft; down which we descended two hundred feet more; and were then full six hundred feet below the surface of the ground.

This was the principal scene of the labour of the miners, and there were great numbers of them at work in their different employments.

Some were boring the rocks; others were charging with powder the holes already made. Some were knocking off the ore with hammers, or prying it with pick-axes; others were loading buckets with ore, to be drawn to the surface; and others were working a windlass to raise the rubbish from one level to another, and so to the top.

All were busy, working by candle or lamp-light; for here the light of day could never come.

We were three hours in exploring the mine; and in this time we travelled a mile under ground. We could seldom walk erect; often we had to crawl on our hands and knees, or lie down flat, and drag ourselves by the points of our elbows and toes.

At one time we went down, and at another we ascended through a narrow opening, where we could hardly squeeze our bodies through. At length we came to the channel,

---

reached; heard; breaking; explosion; define it. Spell echoed; caverns; sulphur; descended; surface; define it. Spell principal; scene; employments; already; knocking; axes; loading; windlass; rubbish; busy; exploring; define it. Spell travelled; crawl; knees; ourselves; ascended; define it. Spell squeeze; bodies; channel.

where the water of the mine flows off, and through this we had to wade along, half leg deep, for thirty rods.

The copper ore was mostly bedded in solid rock; but very little progress can be made without blasting. This is often dangerous, and many lives of the miners are lost by it.

A steam-engine is used to raise the water, and also the ore, out of the mine. The rod is made of pieces of timber, fastened together, and descends more than one thousand feet down a shaft.

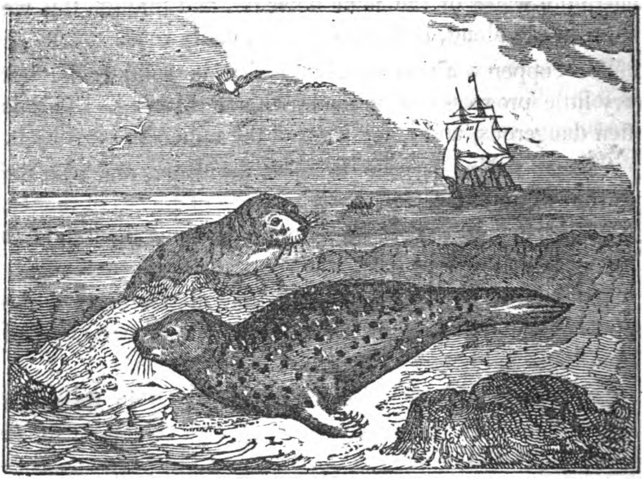
The miners go up every night, and down again in the morning; so that they perform every day the journey up and down those ladders, which appear so dangerous.

But in some mines, the people employed in them are said to live there from year to year, and seldom or never see the light of the sun.

This short account of a copper mine, may give some idea of other mines; except that in coal mines, and some others that are under large hills or mountains, instead of shafts, there are tunnels cut out, level with the bottom of the mine, and through these the coal is drawn out in small cars on rail-roads made in the bottom of the tunnel.

---

through; bedded; progress; blasting; dangerous; steam-engine; pieces; fastened; descends; shaft. What is a shaft? Spell journey; people; coal-mines; mountains; instead; level; through· drawn tunnel. What is a tunnel?



## THE SEAL.

The common seal is an amphibious animal, and frequents the sea-coasts far to the north, where there is mostly an abundance of ice. It lives chiefly upon the finny tenants of the ocean, which it chases with wonderful swiftness. It also feeds on crabs and water-fowls. To catch the latter, the seal dives, and silently coming up under them, seizes them by the feet while swimming.

The front part of a seal's head is very much like that of a dog. The snout, or muzzle, is flat and broad; the eyes are of a dark colour, rather large and shining, having several short, stiff bristles over them. They are placed much nearer to the ears than the nose. The ears are very small, being scarcely at all visible; and the teeth are like other carnivorous animals.

---

Spell amphibious; frequents; sea-coasts; chiefly; finny; ocean; chases; wonderful; seizes; swimming; muzzle; bristles; scarcely; visible; teeth; carnivorous; define it. Spell seal; together; webbe .

The fore legs, or arms of the seal, are short; the feet have five toes or claws, with long black nails; and the toes are joined together by a web, like a goose, to aid it in swimming. The hind feet, or tail, also consists of toes and claws webbed together.

The common seal is about from four to six feet long.—The whole body is covered with thick shining hair, which looks as if it had been rubbed over with oil, and is mostly of a yellowish gray colour.

Seals bring forth their young ones on land, where they suckle them till they are six or seven weeks old, and then lead them to the water.

The seal swims with its head erect, and thus mounts the foaming billows, cleaving the waves with great force and much apparent ease. It dives into the deep, as in an instant, to elude its enemies, or to pursue its prey; and it can remain under water for several minutes,—during which time, its nostrils are closed so as not to admit the liquid, briny element.

Seals appear to be fond of landing on the sea-beach, or on rocks and ice-banks, for the purpose of sleeping or basking in the sunshine. In fine weather they seem to prefer being on the ice, when not engaged in obtaining their food in the water. But when a number of seals are thus basking or sleeping on the ice, which is mostly near the water, they appear to have a sentinel that is always on the look out, in order to discover the approach of an enemy. If a boat or any other enemy is seen coming towards them, on a signal given, they hastily retreat to the water for safety.

The seals are generally very fat, and produce plenty of

---

covered; rubbed; yellowish; suckle; swims; foaming; billows; [illegible]ing; apparent; ease; elude; pursue; prey; minutes; nostrils; [illegible]id; element; sea-beach; purpose; basking; sunshine; weather; obtaining; sentinel; define it. Spell approach; signal; generally;

oil; and their flesh is of a dark red colour. The people who live in those parts of the world where seals abound, use their flesh for food, either cooked or raw. Their oil is used in lamps, and for all purposes to which whale oil is applied.

The skins of seals are used in various kinds of manufactures, such as the making of trunks and saddlery. When tanned, the leather is light, soft, and pliable; and is used for making boots and shoes.

Seal skins are also much used by the natives for various purposes; among which is the making of their boats or canoes. A small boat to carry one person seldom weighs more than fifty or sixty pounds, and is easily carried from place to place. A light piece of wood runs along each side, to which a frame made of whalebone is attached, and seal-skins are stretched over the whole. Sometimes larger boats are constructed so as to carry fifteen or twenty persons, and they are propelled with short oars over the briny waves.

The sealers, or those who hunt and kill seals for the skins and oil, destroy great numbers of them every year. One ship alone has been known to obtain a cargo of four or five thousand seal-skins, and more than a hundred tons of oil.

---

hastily; cooked; their; applied; whale-oil; seals; manufactures saddlery; pliable; shoes; canoes; weighs; easily; whalebone attached; stretched; constructed; propelled; define it. Spel. destroy; cargo; define it.

◆

## BALLOON.

A BALLOON is a large bag, mostly of a round or globular shape, made of silk or some other strong substance; and, to increase its strength, it is enclosed in a firm net-work, made of twine or cordage.

A balloon that is intended to carry a man up in the air, is sometimes as large as a small house; that is, it may be twenty or thirty feet in diameter.

To the bottom or lower part of the net-work which surrounds the silk balloon, there is a little car or light boat fixed by ropes or cords: in this car the man sits, with his books, or tools, or other things that he may want to take with him up in the air.

The balloon, or large silken globe, being made air-tight by means of a gum or varnish spread over it, is filled with hydrogen gas; which is a kind of air much lighter than the common air we breathe.

---

SPELL balloon; globular; substance; increase; strength; twine; enclosed; intended; sometimes; thirty; diameter; define it. Spell bottom; surrounds; silken; air-tight; varnish; spread; hydrogen

It is because this gas is so much lighter than the air of the atmosphere, that it rises upward and carries the balloon and the car, with the man in it, to a great height, even above the clouds.

As the balloon rises in the air, it is carried along by the wind, as the clouds are; and the higher it is from the earth, the smaller it appears, until it gets out of sight.

When the balloon ascends very high, the man in the car often has to let out some of the gas, in order to keep it from bursting.

But, although men have been carried up to very great heights in the air, and have come down again in safety, it looks like a great risk of human life, for little or no real use to any one, nor to mankind at large.

Can it be right for people to venture their lives on dangerous exploits, out of mere idle curiosity? History informs us, that several persons who have gone up in balloons, have been killed by falling from a great height to the ground.

Birds and insects being very light, and furnished by the Creator with wings to bear them up, appear to be designed to fly in the air, as their proper element. So also the fishes are formed to inhabit the waters and to live and move in them, according to their various modes of life.

But in vain have men attempted to construct wings for the purpose of flying in the air, because the power of using them has been beyond the reach of human art to supply. The surface of the earth and of the waters appears to be the proper province of man.

---

**breathe; carried; higher; ascends; bursting; although; heights venture; dangerous; exploits; define it. Spell curiosity; history insects; furnished; inhabit; attempted; construct; surface.**

## NARRATIVE OF A VAIN YOUTH.

In the days of my youth, I began to love gay and wanton company; and though I was kept from using profane language, or being guilty of reproachful conduct; yet there was a plant in me which produced much wild fruit.

My merciful heavenly Father, however, did not utterly forsake me; but at times, through his grace, I was brought seriously to consider my ways; and the sense of my folly and backslidings often affected me with sorrow. But for want of rightly attending to the reproofs of instruction in my own mind, vanity was added to vanity, and repentance to repentance; and I became more and more alienated from the path of innocence, and hastened toward destruction.

When I meditate on the gulf towards which I then travelled, and reflect on my youthful disobedience,—for these things I weep—mine eye runneth down with water.

As I advanced in age, the number of my acquaintances increased, and thereby my temptations were multiplied, and my way became more difficult to be reformed.

Although in my younger days, I had found comfort in reading the holy Scriptures, and thinking on heavenly things, I was now estranged therefrom. I knew I was going from the path of safety and peace, but I seemed to have no resolution to return.

In this state, serious thoughts and reflections were unpleasant to me; while youthful vanities and diversions were my greatest pleasure. Running on in this road, I found many others like myself, and we associated together in that disposition which is the reverse of true friendship.

---

Spell youth; wanton; language; guilty; reproachful; produced; merciful; seriously; backslidings; reproofs; alienated; hastened; gulf; travelled; disobedience; estranged; although; acquaintances; Scriptures; reflections; unpleasant; diversions; associated; dispositions; friendship; doubted; recovery; amazement; confusion;

But in this swift race of youthful folly, it pleased God to visit me with sickness, so that I doubted of recovery. Then did darkness, horror, and amazement, with full force, seize upon me, even when my pain and distress of body were very great.

Being filled with remorse and confusion, and in great affliction both of body and mind, I lay and bewailed my unhappy condition. I had not confidence to lift up my cries unto God, whom I had thus offended: but in a deep and painful sense of my great folly, I was humbled before him.

At length, that Divine Word which is as a fire and a hammer, broke and dissolved my rebellious heart; and then my prayers were put up to God, in the contrition of my soul. In the multitude of his tender mercies, I now found inward relief from my trouble—and felt strong desires, that if he would be pleased to restore me to health, I might walk humbly before him.

After my recovery, this care and concern remained with me for some time. But, by degrees, I again gave way to lightness and youthful vanities; and, getting into company with lively, wanton young people, the same disposition gained strength in me, and I lost ground.

The Lord had been very gracious to me, and spoke peace to me in the time of my distress; but I now most ungratefully turned again to folly; for which at times I felt sharp reproof, but did not get humble enough to ask for his divine help.

I was not so hardened as to commit scandalous actions, or gross wickedness; but to exceed in vanity and promote mirth was my greatest delight. Yet in the midst of this, I

---

**seize; bewailed; rebellious; contrition; concern; youthful; horror; company; remorse; wanton; pleasure; unhappy; whom; sense; dissolved; rebellious; contrition; mercies; relief; recovery; youthful; wanton; ungratefully; enough; scandalous; delivered; scenes;**

often felt sad, and at times wished to be delivered from these vanities.

Thus, I went on for some time in a course of wantonness, mirth, and vanity; while pleasing scenes of amusement were continually presenting to my imagination; until at length I felt the judgments of God in my soul, like a consuming fire; and, looking over my past life, the prospect was awful.

I then resolved totally to leave off some of my vain amusements: but there was a secret reserve in my heart of the more refined part of them; and I did not get humble enough to find true peace.

In this state, I had great trouble of mind; for there remained in me an unsubjected will, which rendered all my resolutions and labours fruitless. Keen convictions still followed me, until, at length, I became willing to bow down in deep humility of soul before God. In this state, I was enabled to pray for his help to deliver me from all those vanities which had so ensnared me.

I was now induced to look seriously at the means by which I had been drawn away from the pure Truth; and as I learned to bear the cross to my selfish desires, I saw clearly that if I would live the life which the faithful servants of God lived in, I must not go into company, as heretofore, in my own will; but all the cravings of sense must be governed by a divine principle.

In times of sorrow and abasement, these instructions were sealed upon my mind. And as I kept humble and watchful, I felt the power of the cross of Christ to prevail over my selfish desires, so that I was preserved in a good degree

---

**wantonness; continually; imagination; length; judgments; awful; totally; amusements; trouble; resolutions; fruitless; humility; enabled; convictions; until; unsubjected; deliver; induced; drawn; seriously; learned; would; servants; heretofore; sense; governed; principle; sorrow; instructions; watchful; prevail; preserved;**

of steadiness of conduct, and avoided such company as had often been a snare to me.

As I lived under the cross, and simply followed the openings of the light of Truth, my mind from day to day was more enlightened. My former companions were left to judge of me as they would: for I found it safest for me to live retired, and to keep these things sealed up in my own mind.

While I silently ponder on that change wrought in me by the power of divine grace, I find no language equal to the description of it, nor any means by which to convey to another a clear idea of it. I looked upon the works of God in this visible creation, and an awful reverence covered my mind. My heart was tender, and often contrite, and universal love to my fellow creatures increased in me.

This will be understood by those who have walked in the same path. Some glances of real beauty may be seen in the countenance of such who dwell in true meekness. There is a harmony and sweetness in the sound of that voice to which divine love gives utterance, and some appearance of right order in their temper and conduct whose passions and desires are rightly regulated. But all these do not fully show forth that inward life to such who have not felt it; for this "white stone," or "new name," is known rightly to such only who have it.

---

**steadiness; avoided; followed; openings; enlightened; companions; sealed; silently; wrought; language; description; convey; visible; idea; reverence; covered; heart; universal; beauty.**

## THE EYE.

THAT which is called the eye-ball is a hollow globe, filled with certain transparent humours, through which the light passes to the inside, or back part of the eye, called the *retina.*

The light that is reflected from any thing we look at, conveys the image of that object to the retina; and this image or likeness is transmitted to the brain through the medium of the optic nerves.

The white of the eye contains a transparent substance, called the *cornea;* behind which is a partition called the *iris*, because of the various colours which it exhibits. It is from the apparent colour of the iris, that the eyes are said to be black, brown, gray, blue, &c.

In the centre of the iris there is an opening, called the pupil of the eye. This can be enlarged or diminished, so as to admit more or less light through it to the retina. Cats, owls, and many other nocturnal animals have very large pupils, which they nearly close in the day-time, so as to appear like a narrow streak; but at night or in the dark, they open the pupils wide, in order to admit the light and gather the scattered rays.

When there is too bright a glare of light, we naturally close or contract the pupil, so as to prevent its giving us pain. For the same reason, we cannot look at the sun, or any very bright dazzling object, without hurting the eye. But when we go from a light room, out in the air of a dark evening, at first it seems very dark: but in a

---

**SPELL** eye-ball; certain; transparent; define it. Spell humours; through; retina; reflected; define it. Spell conveys; image; transmitted; define it. Spell medium; optic; define it. Spell substance; transparent; cornea; iris; partition; colours; exhibits; centre; iris; pupil; diminished; define it. Spell nocturnal; define it. Spell streak; scattered; naturally; dazzling; gradually; delicate; surrounded little while it appears lighter, because we gradually enlarge the pupils of our eyes

The tender and delicate eye, being placed in a hollow, or socket surrounded with bones, is also protected from injury by means of the eye-lids and the eye-brows.

By the muscles of the eye-brows, and the strong hairs that grow on them, the eyes are shaded and often shielded from what would injure them.

But the wisdom and goodness of the Creator, are more abundantly evident in the protection and uses of the eye-lids. These are furnished with delicate hairs called eye-lashes, which form a kind of grate or screen in front of the eye, to defend it from outward dangers, and prevent the entrance of things that would hinder our sight.

The eye-lids also aid in preventing too much light from entering the eye, both when we are awake and when we sleep. But if any dust, or motes, or small particles enter the eye, by the act of winking, they assist in wiping them out.

In order to keep the eye moist and clean, so that it may be bright and clear for seeing objects, a wash or liquid is constantly supplied for that purpose, and spread over the ball of the eye by the action of the lids in winking.

This wash or moisture is the same as tears; only it is furnished in very small portions, in common. It proceeds from a little spongy, fleshy substance, called a gland, which lies under the bone on which the eye-brow is placed, and is out of sight on the side next the temples.

Every time we wink or shut our eyes, these tear-glands are pressed on by the upper eye-lids, and a little moisture is forced out and spread over the ball of the eye, in order to wash it and keep it clean.

---

**hollow; injury; muscles; shielded; define it. Spell abundantly; evident; protection; eye-lids; furnished; grate; screen; preventing. particles; winking; wiping; moist; seeing; liquid; supplied; spread.**

All the dust and fine particles that may get into the eye, are thus washed off by this tear-water, and carried to the corner of the eye next the nose. Here are two little canals in each eye, which convey the tears into larger tubes that pass through the bone, and empty them into the nose; while the dust is sometimes left in the corner of the eye in a little ball, as it is often found in the morning when w awake.

If through joy, or grief, or fear, or pain, or by reason of any thing getting into the eye that causes pain, there is a greater portion of this tear-water pressed out of the glands than can find vent through the tubes into the nose, the eyes overflow, and the tears run down the cheeks. In persons of weak eyes, the same effect is sometimes produced by going out in a cold wind, or looking too intensely at bright or small objects.

If the tubes conveying the water from the eyes into the nose should become stopped, diseases in the eyes might ensue, and the sense of smelling become impaired.

## LATITUDE, LONGITUDE, LENGTH OF DAYS, &c.

The earth on which we live is a large globe, nearly eight thousand miles in diameter; and it turns round on its axis once in twenty-four hours.

The axis of the earth is a line which is supposed to pass through the middle of it from north to south; the north end of which is called the *north pole*, and the south end thereof, the *south pole*.

---

moisture; portions; spongy; substance; eye-brow; pressed; eye-lids; forced; particles; washed; carried; canals; convey; through; morning; getting; overflow; intensely; objects; conveying; stopped; diseases; impaired.

Spell earth; eight; thousand; diameter; axis; through; skies; continued; equally; equator; surface; latitude; reckoned; circle;

If the north end of this axis were continued to the skies, it would strike the north star, very nearly. Hence, the north star is often called the *pole-star.*

The middle of the earth, or a line drawn round it from east to west, and every where equally distant from the poles, is called the *equator.*

The distance of any place on the surface of the earth from the equator, is called the *latitude* of that place.

Latitude is reckoned in degrees and minutes; because every circle is supposed to be divided into three hundred and sixty degrees, and every degree into sixty minutes.

The poles are every where ninety degrees from the equator; and as the latitude is reckoned from the equator towards the poles, so it is evident that latitude can only be counted in a quarter of a circle; that is, within ninety degrees, and it is either north or south.

As every degree on the equator is found to be about sixty-nine miles and a half, so the latitude of any place, in miles, is so many times sixty-nine and a half miles, as there are degrees in the latitude.

Philadelphia is in about forty degrees of north latitude. If we multiply forty by sixty-nine and a half, we shall have two thousand seven hundred and eighty; the number of miles from the equator to Philadelphia.

In geography, every place has its latitude and its longitude.

*Longitude* is the distance, in degrees and minutes, reckoned on the equator from some meridian fixed on as a standard, and it is either east or west.

In maps, the degrees of latitude are commonly placed at the sides or borders of the map, and are north latitude, if

---

divided; degrees; evident; quarter; Philadelphia; eighty; geography; longitude; meridian; represent; directly; horizon; axis; countries;

above the equator, and south, if below it. The degrees of longitude are placed at the top and bottom of the map, and are either east or west.

In globes that represent the earth, the meridian lines on which latitude is reckoned, are circles passing through the equator from north to south, at right angles. But every place between these circles is supposed to have its own meridian, or north and south line.

Longitude is marked in degrees, and is reckoned on the equator only.

When the sun appears to be on, or directly over any meridian, it is noon, or the middle of the day, to all the places that are on that meridian circle.

The line or circle which bounds our view all around us, is called the *horizon*.

As the earth turns on its axis, and all the countries and people on its surface turn with it, so the sun, moon, and stars appear to rise and set in the horizon of every place.

But the length of the day is different in different places on the globe; because they are nearer to or farther from the equator, where the days are always twelve hours long.

The earth goes round the sun once every year in a great circle or ellipsis, called the earth's orbit, which is about one hundred and ninety millions of miles in diameter. But the equator, or middle of the earth is not always in the line of this orbit circle.

The part of the earth which is in the line or plane of this orbit, varies from the equator, and is one-half of the year north of it, and the other half south. The line or part of the earth which is always toward the sun in this orbit circle, is called the *ecliptic line*.

---

**different; twelve; once; ellipsis; orbit; which; diameter; define it.**
**Spell varies; equator; ecliptic; horizon; define it. Spell varies:**

But the sun always rises in that part of the ecliptic line which cuts the horizon; and hence, as it continually varies, the sun rises sooner or later, and causes the days to be longer or shorter.

As the ecliptic line, or apparent path of the sun, is north of the equator in summer, and south of it in winter, so the days are longer than twelve hours in summer and shorter in winter, at all places north of the equator.

The ecliptic circle crosses the equator in two points, which are called the equinoctial points; because when the sun rises in either of these points, the days and nights are equal all over the world.

When the sun rises to the north of east, the days are longer than the nights; and when it rises to the south of east, the days are shorter than the nights, in all places of north latitude.

When the moon is near the full, it is in or near that part of the ecliptic which is opposite to the sun; and hence, in summer, it rises south of east. But in winter, for the same reason, the moon rises, when full, to the north of east, and gives us light, or reflects the sun's light to us during the long winter nights.

## BOTANY.

The natural history of plants, is called Botany.

A perfect plant consists of the root, the trunk or stem, the leaves, the supports, the flower, and the fruit or seed.

The root enables the plant to stand firmly in the ground. The chief nourishment of the plant is also received by the small fibrous parts of the root, which, like so many mouths, absorb the juices from the earth.

---

**continually; apparent; points; equinoctial; either; opposite; reflects; during.**

The trunk or stem is that part of the plant which rises or grows out of the root, and supports the branches, leaves, flowers, and fruit.

The trunk of trees and shrubs consists of several distinct parts; such as the bark, the wood, the pith, and the sap vessels.

The leaves of plants are various in their forms. Some are rough, others smooth; some round, others oval or heart-shaped—some long and narrow, others broad and indented like saw-teeth.

The supports or props of some plants, are of several kinds; such as tendrils, or spiral strings, by which the vine and the pea sustain themselves by embracing trees, poles, or shrubs. Some have foot-stalks to support the leaf, and protect it when the bud first opens; some have thorns, prickles, and stings—others have hair, wool, hooks, and bristles.

The flowers which contain the fruit, consist of seven parts; the calyx, or cup; the corolla, or blossom-leaves; the stamens; the pointal; the seed-vessel; the seed, or fruit; and the receptacle, or base.

The cup is the outer part, formed of one or more green leaves, and it sustains the corolla at the bottom. It is the bud or case which encloses the flower before it expands.

The corolla is that beautiful coloured part of a flower which strikes our attention. These are red, blue, yellow, and almost every shade of colour.

The stamens are those long parts which rise from the bottom of the corolla, and have each a knob or thicker part at

---

Spell botany; history. Define botany; history. Spell flowers; leaves; enables; nourishment; fibrous; define it. Spell juices; earth; branches; shrubs; various; rough; various; tendrils; shrub; sustain; thorns; prickles; bristles. What is the root of a plant? the trunk. Spell fruit; calyx; corolla; stamens; pointal; encloses; receptacle; expands; define it. Spell anthers; pollen; received.

the top, called anthers. Each anther is a kind of box which opens, when ripe, and throws out a yellow dust, called pollen or farina.

The pointal is different in shape from the stamens. It is a kind of knob at the end of a hollow stem that rises near the middle of the flower. The yellow dust of the anthers is received by the pointal, and, passing down the style or hollow stem, reaches the germ or seed-vessel, and forms the seed or fruit.

Botanists have divided all the plants into classes, orders, genera, species, and varieties. Classes are composed of orders; the orders are composed of genera; the genera, of species; and the species, of varieties.

## LIBRARIES.

A LIBRARY is a collection of books, and is commonly called, either a private, a circulating, or a public library.

A private or family library, is a number of books belonging to a particular person, or family, and kept for their own use and reading.

When a person wishes to make a profit on the stock of books in his private library, he may hire them out to other persons to read; and when read they are returned to him again, and the amount of money paid for the use of them.—This is called a circulating library—and the readers sometimes pay by the week, month, or year.

A public library is a collection of books which belong

---

gum; genera; species; varieties. What do flowers contain? What is a calyx? What a corolla? What are stamens? What part of a flower is the pointal? What is an anther? What is pollen? What forms the seed, or fruit? How are plants divided? What are classes composed of?

SPELL library; define it. Spell either; circulating; family; particular; amount; collection; accommodating; contribution; define it.

to a company of persons, called a library company. The money for the purchase of books and accommodating the library, is raised by shares, or equal contributions from all the members of the company.

The books are taken out of the library by the members, for the purpose of reading them, and may be kept out a certain number of days or weeks, and then returned. The person who has special charge of the library, keeps account of the loans of books to the members, and is called the librarian.

Each member of the company commonly pays an annual sum, to be applied to the purchase of new works for the library. This is mostly done by directors chosen by the library company.

## PROCESS OF MAKING PAPER.

A PAPER-MILL is a building used for the purpose of making paper. The force of water or steam is commonly applied to set the machinery of the mill in motion.

Paper for writing or printing on, is mostly made of cotton or linen rags. These are first sorted, and then cut into small pieces, from four to five or six inches square. This part of the work is often done by women and children.

The rags are then thrown into a large screen or cylinder made of coarse wire, which is turned round and shaken by the force of the mill power. This sifts out the dust and loose dirt from among the rags.

They are next put into a large tub or vessel, with a proper

---

Spell special; librarian; annual. Define annual. Spell directors; purchase. What is a library? a private library? a public library? a circulating library?

SPELL process; building; purpose; commonly; machinery; motion; writing; linen; pieces; square; women; thrown; cylinder; screen; coarse; shaken; loose; vessel; quantity; engine; machine quantity of water. In this tub there is an engine or cutting machine, with two sets of blunt knives, one fixed on the other, turning round.

This cutting machine is made to turn swiftly round in the tub, by means of the mill-power; and as it turns among the rags and water, it keeps them in constant motion, until they are worked into a pulp, or mass of matter that looks somewhat like thick cream.

This process takes from ten to twenty hours, as the rags are softer or more firm in their texture. During part of this time, small quantities of water are made to run in at one side of the tub, and out at the other, in order to render the pulp clean and white. It is also sometimes needful, in order to bleach the pulp, that is, to make it perfectly white, to throw into the tub a small quantity of chloride of lime and oil of vitriol.

The pulp may likewise be coloured, by adding any kind of dye-stuff, that becomes perfectly mixed with it by the motion of the cutting machine. Hence the paper will be blue, pink, red, yellow, orange, green, or any other colour that fancy may dictate.

The rags being thus reduced to a fine pulpy substance, the next process is to make the paper. This is done by letting out the pulp with a proper quantity of water, into a eservoir or large vessel; from which it is drawn off into a vat or tub, as fast as it may be needed.

With this vat is connected the paper-making machine. This has a hollow cylinder, enclosed with a fine web of

---

knives; swiftly; motion; define it. Spell somewhat; process; define it. Spell texture. Define texture. Spell quantities; white; bleach. Define bleach. Spell throw; chloride; vitriol; coloured; adding, dye-stuff; perfectly; machine; define it. Spell yellow; orange; colour; dictate; define it. Spell reduced; substance; reservoir. What is a reservoir? Spell drawn; connected; define it. Spell cylinder. What is a cylinder? Spell enclosed; immersed; define it. Spell diameter. What is diameter? Spell regular; continued;

wire-cloth, which is immersed in the contents of the vat more than half of its diameter.

As this cylinder is turned round by the mill-power, it takes up the pulp in a regular thin sheet, the water passing off through the wire-cloth: and this continued sheet is received from the cylinder by an endless web of woollen cloth, which carries it round another cylinder. It then passes between two other cylinders, by which it is partly pressed.

This continued sheet next passes between copper or iron cylinders that are heated by steam. The heat of these cylinders dries the paper in its passage through them; and in this state it is carried by rollers into and through a box, which contains a mixture of thin glue and alum, called *sizing*.

A very thin coat of this sizing is what prevents the ink from spreading on writing-paper, and tends to render it more firm and smooth.

After leaving the sizing-box, the paper passes through other pressing rollers to make it dry enough for the cutting machine. This being attached to the paper-making machine, cuts it into sheets of a proper size. These are taken to the drying-room, and hung on poles till they are perfectly dry.

The remaining process is in the finishing-room; where these sheets are pressed very hard, by means of strong screw-presses. After which they are passed through rollers which put a gloss on the paper, called callendering.

They are then put up in quires and reams, ready for the market. Twenty-four sheets make a quire, and twenty quires make a ream.

---

received; woollen; iron; passage; rollers; alum; sizing; spreading; leaving; through; pressing; enough; attached. Define attached. Spell drying-room; perfectly; remaining; process; define it. Spell finishing; screw; callendering; straw; wrapping-paper; paste-boards; descriptive; machinery; operations; visible; define it. Spell information; obliging; practical; knowledge.

There are other substances beside cotton and linen, of which paper is sometimes made; as hemp, straw, grass, and the bark of several kinds of trees.—Some of these are used for making coarse wrapping-paper, paste-boards, and various other useful articles.

After all that can be said, descriptive of the labour, machinery, and operations of making paper, a visit to a paper-mill, and a careful attention to the visible process, with a little information from obliging workmen or owners, will give a more practical knowledge of this useful art than any thing else.

## DESCRIPTION OF A VOLCANO.

A VOLCANO is a burning mountain, that throws forth flames of fire, smoke, ashes, and red-hot stones.

Some of the most noted volcanoes are in mount Etna, in Sicily; mount Vesuvius, in Italy; and mount Hecla, in Iceland. There are also several volcanoes in South America.

Some persons who went up to the top of mount Vesuvius, many years ago, gave the following account of that terrible volcano; which may give an idea of the awful state of what is called an eruption, or the boiling over of melted matter, and the casting out of stones, smoke, and fire.

The hole, or opening, out of which the fire and smoke issue, is called the crater of the volcano. In this case, it was thought to be about five hundred yards, or nearly one-third of a mile in diameter, and one hundred yards deep.

When they first arrived at the top of the mountain, the crater was so full of smoke that they could not see its

---

SPELL description; volcano; mountain; throws; Sicily; Vesuvius; Italy; Hecla; several; America; years; terrible; define it. Spell idea; eruption; define it. Spell boiling; opening; issues; volcanoes. What is a volcano? Spell diameter. Define diameter. Spell arrived; crater. What is a crater? Spell depth; figure; heard;

depth and figure. But they heard within it horrid sounds, which seemed to proceed from the bowels of the mountain; and at times a noise like that of cannon or thunder, with a clattering, like the falling of tiles from the tops of houses.

As the wind changed, the smoke grew thinner, and they saw a very ruddy flame, while the sides of the crater were streaked with red and some shades of yellow.

After staying there about an hour, and the smoke being moved by the wind, they had short and partial prospects of the great hollow of the crater; in the bottom of which they could see two boiling fires, like furnaces, near to each other. One of them seemed to be about three yards wide; it was glowing with a ruddy flame, and throwing up red-hot stones with a hideous noise. These stones, as they fell back on the bottom of the crater, caused the clattering noise, as before noted.

Next morning they went up to the top of Vesuvius a second time. There being now no wind, the smoke ascended upright, and they had a full view of the crater.

A conical hill, like a large hay-stack, had been formed by the stones that were thrown up and had fallen back again into the crater. In this hill the two furnaces remained, which they saw the day before.

One of these furnaces, with a dreadful sound, every three or four minutes threw up a vast number of red-hot stones, that went (as was supposed) at least three hundred feet higher than their heads above the mouth of the crater; but as there was no wind, they fell back again to the place where they had been discharged.

---

horrid; proceed; bowels; clattering; falling; thinner; streaked; grew; yellow; staying; hour; partial; define it. Spell prospects; bottom; furnaces; three; glowing; ruddy; define it. Spell hideous; throwing; second; ascended; view; conical; define it. Spell thrown; fallen; remained; dreadful; threw; higher; crater; define it. Spell discharged; furnace; liquid; raging; abrupt; boiled; conical;

The other furnace was filled with red-hot liquid matter, raging and working like the waves of the sea, with short abrupt noises. This red-hot matter sometimes boiled over, and ran down the sides of the conical hill, where it hardened as it cooled.

If the wind had happened to blow towards these curious observers, they would have been in great danger of being stifled by the sulphurous smoke, or killed by the masses of melted minerals and red-hot stones that were shot from the bottom. But as the wind was calm, they had an opportunity of viewing this wonderful scene for more than an hour and a half, before they descended the mountain.

About a month afterward, a dreadful noise was heard at Naples, a city about seven miles distant, and the crater on the mountain was seen to work over.

Three days after this, the thunders of the volcano were renewed, so that not only the windows, but all the houses in the city were shaken. For several days, the lava, or melted mass of liquid matter, continued to overflow; and sometimes at night there were seen large columns of fire shooting upwards from the crater.

After subsiding for a short time, the mountain again renewed its terrors, roaring and raging with great violence. To form some idea of the terrific noise, in some of the most violent fits of the volcanic eruption, we may imagine a confused mixed sound, made up of the raging of a tempest or hurricane, the murmur of a troubled sea, and the roaring of thunder and artillery, all jumbled together.

These dreadful sounds were heard at the distance of twelve miles, and were very terrible. Yet those curious

---

hardened; happened; curious; observers; stifled; sulphurous; define it. Spell minerals; opportunity; viewing; wonderful; scene; descended; afterward; dreadful; heard; Naples; thunders; volcano; renewed; windows; liquid; continued; overflow; columns; terrors; subsiding; roaring; terrific; define it. Spell imagine; confused;

men resolved to approach nearer to the volcano. For this purpose, they rode about four or five miles up the side of the mountain, before they came to the torrent of liquid, fiery matter that was running down from the crater.

The roaring and noise now became very loud and terrible; and they could see a mixture of colours in the cloud of smoke that was above the crater, such as green, yellow, red, and blue. There was also a ruddy, dismal looking light in the air, over the tract of ground where the river of burning lava flowed.

A vast torrent of liquid, fiery matter now rolled from the top down the sides of the mountain, and with dreadful force and fury bore down and consumed vines, olives, and houses; dividing itself into different channels, according to the unequal surface of the ground over which it passed.

The largest stream of this fiery liquid matter, seemed to be at least half a mile wide, and five miles long. There was likewise a strong smell of sulphur, that arose from this burning stream, enough to take away a man's breath if he came near it.

The mountain continued to throw up huge spouts of fire and burning stones; sometimes there were several distinct columns of flame and smoke, and sometimes only one that was large enough to fill the whole crater.

These burning columns and fiery stones seemed to be shot a thousand feet above the summit of the volcano. And the red-hot stones, in falling, looked somewhat like the stars in a rocket.

In this manner the mountain burned and raged for about a week, and then became quiet, without any visible smoke or flame.

---

violent; hurricane; artillery; jumbled; resolved; approach; fiery, terrible; lava; define it. Spell torrent; define it. Spell dividing; channels; unequal; surface; stream; sulphur; enough; columns; huge; summit; define it. Spell visible; eruptions; volcanic; acres; destroyed; buried.

In one of the eruptions of this volcanic mountain, two large cities were destroyed and buried in the stream of burning lava. At another time, five thousand acres of rich vineyards and fields were totally destroyed, and many people perished.

## CORKS.—GUM-ELASTIC.—CASTINGS.

The cork-wood that is used for stoppers to bottles, vials, and several other purposes, is the bark of a tree that grows in France, Spain, and other parts of Europe.

The cork tree is a kind of oak, which bears acorns like other oaks. When these trees are about fifteen years old, the bark becomes very thick; it is then peeled or stripped off from the body of the trees, and a new bark soon grows to supply its place; for the trees do not die because the bark is taken off.

Once a year, the bark being taken off in large sheets, is put into vats or pits, and covered with water. In this state these sheets of bark are pressed with heavy weights for some time to make them flat.

When these sheets or flakes of bark are well soaked, they are taken out of the water and dried. After which, they are put up for market, or for the cork-cutters to form into various sizes of corks, soles for shoes, and other purposes. This is done with very sharp knives and other instruments, and affords employment for many people.

Gum-Elastic is the juice or gum that issues from a tree which grows in South America.

Holes being cut in the bark of these trees, the sap or gum

---

Spell stoppers; vials; Spain; Europe; oaks; fifteen; peeled; stripped; year; heavy; weights; soaked; dried; sizes; soles; knives; instruments; employment; define it. Spell gum-elastic; juice; issues; South America; oozes; define it. Spell milky; exoozes out in the state of a white, milky substance. This hardens by being exposed to the air; but in its soft, liquid state, it may be formed into various shapes by means of molds of different kinds.

Formerly, the use of this article was very much confined to the rubbing out of marks made by black-lead pencils, and was then called India-rubber. Now, it is used for over-shoes, boots, and many other things, being found to be water-proof; that is, not to admit any water to pass through it.

Gum-elastic may also be drawn out into threads, so fine as to be woven with other materials into cloth, suspenders, garters, bandages, and other useful articles.

A FOUNDRY is a building, or place where they melt and cast many kinds of metals; such as iron, brass, copper, lead, and bell-metal.

The metal is commonly melted by a strong heat, obtained from the burning of wood or coal.

The patterns, or models of things that are to be cast, are mostly made of wood, or some kind of metal.

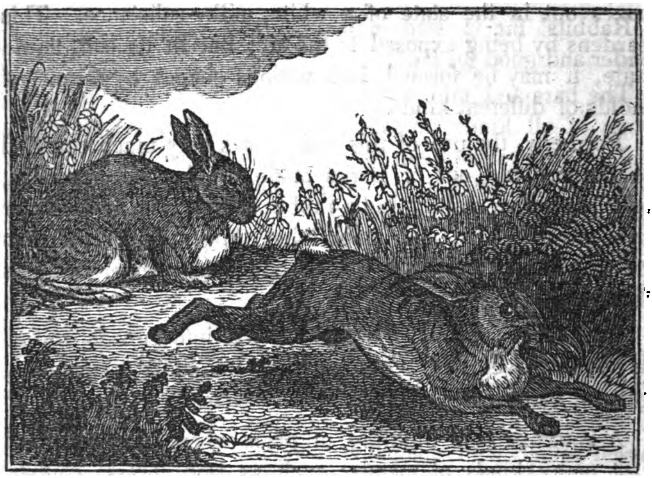
These patterns are placed in wet or moist sand, which forms around them the mold, into which the melted metal is poured, after the pattern is removed.

Cold water is sometimes thrown on to cool the articles thus cast; after which, the molds are taken away, in order to come at the castings.

In this way stove-plates, grates, pots, tea-kettles, flat-irons, bells, andirons, and a great many other things are cast.

---

posed; liquid; formerly; article; rubbing; black-lead; pencils; India-rubber; shoes; through; drawn; threads; materials; useful; suspenders; bandages; foundry; building; metals; commonly; obtained; coal; patterns; models; placed; moist; around; mold; poured; removed; sometimes; thrown; articles; stove-plates; tea-kettles; grates; flat-irons; andirons.



## THE HARE AND RABBIT.

These animals are very much alike, only the hare is larger than the rabbit. Both of them are very timid and harmless; but their eyes being large, are placed so far back in the head, that they can easily see behind them, as well as on all sides round them.

Their ears are also large, and they can turn them every way they choose, in order to catch the sound of any noise that is made near them.

The muscles of their bodies and legs are also very strong, and the length of their hind-legs enables them to flee from their enemies with great swiftness and speed.

Hares and rabbits live on grass, herbs, and vegetables in summer. In winter, they feed on buds, twigs, and the bark of trees, or on dead grass and weeds.

---

Spell animals; rabbit; timid; define it. Spell easily; muscles; catch; bodies; length; enemies; swiftness; vegetables; twigs; objects; prey; define it. Spell pursue; eagerness; vermin; seize.

Rabbits' fur is used in making hats, and their flesh is tender and good for food.

The hare and rabbit are both of them objects of prey. Dogs of all kinds pursue them with eagerness; cats and other vermin seize them for food; hawks, eagles, and other birds of prey catch their young ones; and men and boys destroy more than all the rest.

In England, where hares abound, their young ones are called leverets.

William Cowper, the English poet, being affected by a nervous complaint, undertook to tame three young hares; of which he wrote the following history.

"Being much indisposed, and not capable of diverting myself either with company or books, I was glad of any thing that would engage my attention without fatiguing it. The children of a neighbour had a leveret given them for a plaything, and it was at that time about three months old. As they understood how to tease the poor creature, better than to feed it, and having become weary of the charge, they readily consented that their father, who saw it pining and growing leaner every day, should offer it to me. I was willing to take the prisoner under my protection; thinking, that in the management of such an animal, and in the attempt to tame it, I should find just that sort of employment which my case required.

It was soon known among the neighbours, that I was pleased with the present; and the consequence was, that in a short time I had as many leverets offered me as would have stocked a paddock.

I undertook the care of three, to which I gave the names

---

hawks; eagles; England; young; leverets; nervous; define it. Spell complaint; following; history; indisposed; diverting; attention; fatiguing; neighbour; plaything; understood; tease; weary; readily; prisoner; protection; management; employment; known; consequence; stocked; paddock; define it. Spell commenced; car of Puss, Tiney, and Bess; though they were all males. I then commenced carpenter, and built them houses to sleep in, with each a separate apartment. In the day-time, they had the range of a hall, and at night retired each to his own bed, never intruding into that of another.

Puss soon grew familiar,—would leap into my lap,—raise himself upon his hinder feet, and bite the hair on my temples. He would suffer me to take him up and carry him about in my arms; and has more than once fallen fast asleep on my knee.

He was ill three days; during which time I nursed him, kept him apart from his fellows, that they might not hurt him, (for, like many other wild animals, they persecute one of their own species that is sick,) and by constant care, and trying a variety of herbs, he was restored to perfect health.

No creature could be more grateful than my patient after his recovery; a feeling which he most significantly expressed by licking my hand; first, the back of it; then, the palm; then, every finger separately,—then, between all the fingers, as if anxious to leave no part of it unsaluted:—a ceremony which he never performed but once again on a similar occasion.

Finding him very tractable, I made it my custom to carry him, after breakfast, into the garden; where he generally hid himself under the leaves of a cucumber-vine, sleeping, or chewing the cud until evening.

I had not long habituated him to this taste of liberty, before he began to be impatient for the return of the time when he might enjoy it. He would invite me into the garden by drumming on my knee, and by a look of such expression as

---

penter; built; separate; intruding; familiar; hinder; fallen; nursed fellows; persecute; species; constant; variety; health; creature grateful; patient; recovery; significantly; expressed; separately anxious; unsaluted; ceremony; similar; define it. Spell tractable breakfast; cucumber; chewing; habituated; impatient; drumming

it was easy to interpret. If this rhetoric did not soon succeed, he would take the skirt of my coat between his teeth, and pull at it with all his force.

Thus, Puss might be said to be perfectly tamed; the shyness of his nature was done away; and, on the whole, it was plain by many symptoms which I need not enumerate, that he was happier in human society than when shut up with his natural companions.

Tiney's disposition differed from that of Puss. Upon him the kindest treatment had not the least effect. He too, was sick; and in his sickness had an equal share of my attention. But if, after his recovery, I took the liberty to stroke him, he would grunt, strike with his fore-feet, spring forward, and bite.

He was, however, very entertaining in his way. Even his surliness was matter of mirth: and in his play he showed such an air of gravity, and performed his feats with such a solemnity of manner, that in him too I had an agreeable companion.

Bess died soon after he was full grown. His death was occasioned by being turned into his box (which had been washed) while it was yet damp. He was a hare of great humour and drollery.

Puss was tamed by gentle usage; Tiney was not to be tamed at all; and Bess had a courage and confidence that made him tame from the beginning.

I always admitted them into the parlour after supper; when, the carpet affording their feet a firm hold, they would frisk and bound, and play a variety of gambols; in which Bess, being strong and fearless, was always superior to the rest.

---

knee; interpret; rhetoric; shyness; symptoms; society; companions; disposition; recovery; entertaining; surliness; mirth; solemnity; showed; agreeable; occasioned; humour; drollery; define it. Spell usage; courage; beginning; parlour; affording; variety; gambols;

One evening, the cat being in the room, she had the boldness to pat Bess upon the cheek;—an indignity which he resented by drumming upon her back with such violence, that the cat was glad to escape from under his paws and hide herself.

I describe these animals, as having each a character of his own. Such they were in fact;—and their countenances were so expressive of that character, that when I looked only on the face of either, I immediately knew which it was.

Hares have a singular sagacity in discovering the minutest alteration that is made in the place to which they are accustomed, and instantly apply their nose to the examination of a new object. A small hole being burnt in the carpet, it was mended with a patch, and that patch soon underwent a strict scrutiny.

Hares seem to be very much directed by the smell in the choice of their favourites. To some persons, though they saw them daily, they could never be reconciled; but a miller coming in, engaged their affections at once: his powdered coat seemed to have charms that were irresistible.

Bess died young. Tiney lived to be nine years old. Puss is living, and has just completed his tenth year. I lately introduced a dog to his acquaintance,—a spaniel that had never seen a hare, to a hare that had never seen a spaniel. I did it with great caution; but there was no real need of it. Puss showed no token of fear, nor the spaniel the least symptom of hostility.

They eat bread at the same time out of the same hand, and were in all respects sociable and friendly.

---

superior; evening; indignity; resented; drumming; violence; escape; describe; character; countenances; expressive; immediately; singular; sagacity; discovering; alteration; accustomed; examination; scrutiny; choice; favourites; reconciled; engaged; affections; powdered; irresistible; completed; introduced; spaniel;

There is, therefore, it would seem, no natural antipathy between dog and hare; but the pursuit of the one occasions the flight of the other; and the dog pursues, because he is trained to it.

It is no wonder that my intimate acquaintance with these specimens of the kind, has taught me to hold the sportsman's amusement in abhorrence. He little knows what amiable creatures he persecutes—of what gratitude they are capable,—how cheerful they are in their spirits! what enjoyments they have of life! and that, impressed as they seem with a peculiar dread of man, it is only because man gives them peculiar cause for it.

"Detested sport,
That owes its pleasures to another's pains,
That feeds upon the sobs and dying shrieks
Of harmless nature, dumb, but yet endued
With eloquence that agonies inspire,
Of silent tears, and heart-distending sighs!
Vain tears, alas! and sighs that never find
A corresponding tone in sportsmen's souls!
Well—one at least is safe. One shelter'd hare
Has never heard the sanguinary yell
Of cruel man, exulting in her woes.
Innocent partner of my peaceful home,
Whom ten long years' experience of my care
Has made at last familiar,—thou hast lost
Much of thy vigilant, instinctive dread,
Not needful here beneath a roof like mine.
Yes—thou mayst eat thy bread, and lick the hand
That feeds thee; thou mayst frolic on the floor,

---

acquaintance; caution; symptom; hostility; antipathy; define it Spell pursuit; sociable; friendly; specimens; sportsmen; abhorrence; amiable; creatures; capable; cheerful; impressed; cause, peculiar; shrieks; eloquence; agonies; distending; corresponding sanguinary; exulting; innocent; peaceful; experience; familiar

At ev'ning, and at night retire secure
To thy straw couch, and slumber unalarm'd;
For I have gained thy confidence—have pledg'd
All that is human in me to protect
Thine unsuspecting gratitude and love.
If I survive thee, I will dig thy grave,
And when I place thee in it, sighing, say
I knew at least one hare that had a friend."

## DRUGS.

Liquorice is obtained from the root of a plant which grows in many parts of France, Spain, and Germany. The plant which affords the liquorice-root, grows from one to two feet in height; the leaves of which are of a dark glossy green colour.

The juice of the liquorice-root obtained by boiling, is very sweet; and when the watery particles are evaporated, it is worked into liquorice balls or rolls, fit for common use.

What is called liquorice stick, is the root of the plant dried in its natural state.

Liquorice ball is refined or purified by the help of isinglass and evaporation. It is often found good for coughs, and also to allay thirst.

Rhubarb is a plant that grows in Turkey and Russia. It also grows in China, and other parts of the world. Rhubarb is of a yellow colour, and is often used in medicine.

Asafœtida is a compact, gummy, and resinous substance; which is brought from Persia and the East Indies.

It is soft and pliable like wax; it has a bitter, biting taste, and smells like garlic, but much stronger.

---

vigilant; define it. Spell instinctive; beneath; bread; frolic; straw; couch; unalarmed; pledged; unsuspecting; gratitude; define it. Spell sighing; knew; friend.

Asafœtida is used in medicine, as a powerful stimulant of the nervous system.

**MANNA** is extracted from the larch and ash trees, as also from some others. It flows from the ash in form of white clear drops. When holes are cut in the body of the tree, it exudes, or runs out in the form of sap, which soon hardens in the air and sunshine, and is gathered for use.

The best manna is imported from Sicily. It is a drug that is often used as medicine.

**MYRRH** is the produce or gum that is obtained from a tree which grows in Arabia, and also in the East Indies. It is hard, dry, and has a fragrant smell, but is bitter to the taste. It is chiefly used in medicine, and is sometimes called gum-myrrh.

From the tree called Lignum-vitæ, which grows in the West India islands, there is a resin or gum obtained, which is called gum-guaiacum. This drug is sometimes procured by tapping the trees, and sometimes by boiling the chips and saw-dust of the wood.

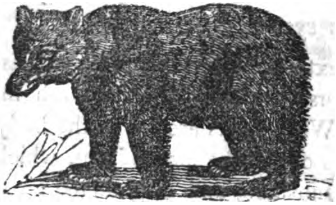
**GUM-GUAIACUM** has somewhat of a fragrant, spicy smell, but is bitter and acrid to the taste. It is used as a remedy for chronic rheumatism, and some other diseases.

**TRAGACANTH** is a kind of drug or gum, obtained from the plant called goats-thorn. It is of great use in medicine. It is also used by curriers and skin-dressers, in preparing leather.

This drug was formerly called gum-dragon. The plants which produce it grow in the Levant; and it is chiefly brought to us from Turkey.

---

SPELL liquorice; obtained; Germany; height; evaporated, define it. Spell isinglass; cough; rhubarb; Russia; yellow; medicine, resinous; Persia; pliable; define it. Spell garlic; nervous; extracted; exudes; define it. Spell Sicily; myrrh; fragrant; chiefly; obtained; gum-guaicum; remedy; chronic; rheumatism; curriers chiefly; Turkey.



## THE POLAR BEAR.

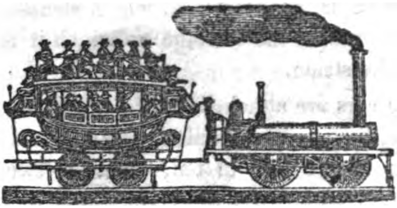
Along the icy shores of Baffin's bay,
Where dreary winter long protracts his stay,
The howling wolves in num'rous packs abound,
And, still more fierce,—the polar bear is found.
Shaggy and grim, she prowls around for prey,
And oft besets the lonely traveller's way.

Yet even in this huge creature, fierce and bold,
One mild and kindly trait we may behold;
For, with peculiar tenderness imprest,
Maternal feelings glow within her breast.
When on her steps her feeble young attend,
With what fond care does she their lives defend!
If they be wounded, piteous is her moan,
And for their safety she forgets her own.
These,—only these, her anxious feelings claim,
She dies to shield them from the hunter's aim.

O love maternal! not bestow'd in vain,
Thou strongest link in nature's golden chain,
How can our hearts enough revere thy power,
Which thus can triumph in a dying hour;
And even in forms like this so nobly prove
That nature's Author is a God of love!

---

Spell dreary; howling; fierce; polar; prowls; huge; define it. Spell peculiar; piteous; anxious; maternal; define it. Spell enough; revere; triumph.



## RAIL-ROADS.

When a rail-road is to be made from one place to another, a track for it is sought which may be the nearest to a level that can be found in the route.

The ground is then made quite level, or very nearly so, by digging down the higher parts or hills, and filling up the lower parts, or valleys. This is called grading.

When the ground for a rail-road is thus levelled and prepared, a solid foundation is laid, either of logs or stone, laid crosswise, a few feet apart. On these, strong pieces of timber are placed, at equal distance, for the track of each wheel of the car or carriage that is to run upon it. On these timbers, bars of iron about two or three inches wide are firmly fastened, reaching the whole distance of the rail-road. These are called the track.

Sometimes, instead of timbers and bars of iron, strong pieces of cast-iron are laid on the solid foundation, and firmly secured there, for the wheels to run on.

The wheels of the rail-road cars are made of cast-iron, and are so formed as to follow the track without running off on either side. By fixing the axles of these wheels so as to run on little rollers, called friction-rollers, they run very easy; as there is but little friction or rubbing to hinder their motion, or turning round.

---

Spell rail-road; sought; which; digging; valleys; levelled; foundation; either; pieces; wheel; carriages; iron; fastened; reaching; instead; without; axles; friction; define it. Spell rollers;

A locomotive is an engine to which steam-power is applied, so as to propel the carriage on which it is placed, by the force of the steam.

When the cars are attached to the locomotive-engine or steam-power, they are drawn along the rail-road by the force of the steam, at the rate of ten, fifteen, or twenty miles an hour.

A train of cars consists of a number of them, fastened or hooked one to another, and all drawn by the same locomotive, or steam-engine. In these, the passengers ride to the amount of hundreds—and have their baggage or trunks carried in the baggage-cars.

## FRANKLIN'S WHISTLE.

The story of Franklin's whistle has been so often told and read, that old people may think it stale. But many children may read this book, who never heard it before. To them it may be new, and convey a lesson of instruction or caution that may be of use in after life.

It may teach them to be careful of their spending money, and not hastily lay it out for things of little or no value. It may lead them to reflect, and to consider how many of the pursuits of young children (and old ones too) are no better than Franklin's whistle, for which he gave all his pocket-money.

"When I was a child of seven years old," says Benjamin Franklin, "my friends, on a holiday, filled my pockets with half-pence. I went directly toward a shop where toys for children were sold; and, being charmed with the sound

---

rubbing; motion; locomotive; engine; propel; define it. Spell attached; steam; fastened; steam-engine; passengers; baggage; amount; hour.

Spell holiday; half-pence; whistle; voluntary; money; whistling;

of a whistle in the hands of another boy whom I met by the way, I voluntarily offered him all my money for it.

I then came home, and went whistling over the house, much pleased with my whistle, but disturbing all the family.

My brothers and sisters and cousins, hearing of the bargain I had made, told me I had given four times as much for it as it was worth. This put me in mind what good things I might have bought with the rest of the money; and they laughed at me so much for my folly, that I cried with vexation. My reflections on the subject gave me more chagrin than the whistle gave me pleasure.

This little event, however, was afterwards of use to me, for the impression continued on my mind; so that often, when I was tempted to buy some unnecessary thing, I said to myself, Do not give too much for the whistle; and so I saved my money.

As I grew up, came into the world, and observed the actions of men, I thought I met with many, very many, who gave too much for the whistle.

When I saw any one too ambitious of court favour, so as to sacrifice his time in attendance on levees, his repose, his liberty, his virtue, and perhaps his friends, to attain it, I have said to myself, This man gives too much for his whistle.

When I saw another fond of popularity, constantly employing himself in political bustles, neglecting his own affairs, and ruining them by that neglect, He pays, indeed, said I, too much for his whistle.

If I knew a miser who gave up every kind of comfort in living,—all the pleasure of doing good to others,—all the esteem of his fellow-citizens, and the joys of benevolent

---

disturbing; cousins; bargain; laughed; vexation; chagrin; pleasure; impression; buy; unnecessary; ambitious; sacrifice; popularity; friends; political; bustles; pleasure; citizens; benevolent; wealth.

friendship, for the sake of accumulating wealth: Poor man, said I, you indeed pay too much for your whistle.

When I met a man of pleasure, sacrificing every laudable improvement of mind, or of fortune, to mere sensual gratification; Mistaken man, said I, you are providing pain for yourself, instead of pleasure: you give too much for your whistle.

If I saw one fond of fine clothes, fine furniture, and other fine things,—all above his fortune, and for which he contracted debts, and ended his career in prison; Alas! said I, he has paid dear, very dear for his whistle.

In short, I conceived that great part of the miseries of mankind were brought upon them, by the false estimate they had made of things, and by their giving too much for their whistles."

## THE MOON.

The moon is a large round body, like the earth on which we live. It is supposed to be composed of land and water, with mountains, rocks, and seas, and it may be inhabited for any thing we know.

Astronomers have found that the moon is more than two thousand miles in diameter; or about one-fifteenth part as large as the earth.

It is two hundred and forty thousand miles from us; and it goes round the earth from west to east, at this great distance, in about twenty-nine days and a half.

When the moon passes directly between us and the sun, we say the sun is eclipsed. But it does not very often come

---

**accumulating; pleasure; sacrificing; laudable; define it. Spell sensual; gratification; mistaken; clothes; furniture; contracted; debts; career; conceived; miseries; false; estimation; giving; whistles.**

exactly between us and the sun, but passes in its course not very far off; and when we see it in the west after sunset, it is called *new moon*.

The moon is a dark body in itself; but the sun shines upon the side or part of the moon that is nearest towards it, and the light of the sun is reflected from it to us; that is, we see the light that shines on the part of the moon which is towards us.

Hence, when it is new moon, that is, when the moon is seen in the west nearly in a line with the sun, we see but a narrow crooked streak of the light part of the moon. But as the moon goes round the earth from the west towards the east, when it gets on the opposite side from the sun, we see the whole light side of it, and then we call it *full moon*.

But sometimes it happens that the moon, in going round the earth, comes into the shadow of the earth about the time of full moon, and then we say the moon is eclipsed; that is, the sun does not then shine upon it, or part of it, because the earth is directly between the sun and the moon.

The moon always presents the same side or face to us; by which it appears that it turns upon its axis but once while it is going round the earth. The moon has therefore but one day and one night in about a month.

---

Spell mountains; inhabited; astronomers; diameter; fifteenth; distance; directly; between; eclipsed; exactly; towards; reflected; crooked; streak; opposite; whole; sometimes; happens; earth; shadow; eclipsed; does; directly; always; appears; axis; therefore.

## FRIENDSHIP.

FRIENDSHIP'S a pure, a heaven-descended flame,
Worthy the happy region whence it came:
The sacred tie that virtuous spirits binds,—
The golden chain that links immortal minds.

Can wealth gain friendship? Impudence of hope,
As well mere man an angel might produce.
Love, and love only is the price for love.

If thou wouldst hope to gain a real friend,
Repress thy selfish pride, nor hope to find
A friend, but what has found a friend in thee.

But since friends grow not thick on ev'ry bough,
Nor ev'ry friend unrotten at the core,—
First, on thy friend, deliberate with thyself;
Pause, ponder, sift; not eager in the choice
Nor jealous of the chosen; fixing, fix;
Judge before friendship,—then confide till death.

A friend is worth all hazards we can run;
Poor is the friendless master of a world:
A world in purchase for a friend is gain.

The sweetest social happiness on earth
Is found within the bosom of a friend,
Where heart meets heart, reciprocally soft,
Each other's pillow to repose divine.

Of friendship pure, whose rest is heav'nly love
The fairest fruits are wisdom, peace and joy.
As bees sweet honey draw from fragrant flow'rs,
So we from friendship, comfort and delight,
To soothe the troubles of this lower world.

---

SPELL friendship; descended; region; virtuous; immortal; mere; impudence; angel; wouldst; friend; bough; unrotten; deliberate; thyself; pause; fixing; eager; jealous; hazards; friendless; social; purchase; sweetest; reciprocally; define it. Spell pillow; divine.

## RECEIPTS.—BOOK-KEEPING.

When one man pays money to another, it is proper to take a receipt for it.

A receipt for money paid, is a writing given by the receiver to the payer; stating the sum of money received, the time when it was paid, and sometimes the articles or things for which the money was due.

When only part of the amount due, is paid, the receipt should state the sum received to be *in part*, or *on account*, of the debt due. But when the whole sum due is paid, the receipt should mention it *in full.*

The sum of money mentioned in a receipt should always be written in words, and not expressed in figures.

When a person buys goods of another, and does not then pay for them in money, or some other thing of equal value, he is said to buy on credit. The seller then charges him with the articles purchased, and enters the account in a book; making the purchaser *debtor* to the goods sold. This is called book-keeping.

When the account is settled, the book-keeper enters on the opposite page, or credit account, the date and the sum of money paid, or other articles received *in full.* This is called balancing the account.

But if only part of the amount due is paid, he enters so much, or such articles received, and gives the person credit for the same.

An expense-book contains an account of all moneys paid for articles of common expenses.

---

Spell receipts; money; writing; receiver; articles; amount; received; should; mentioned; written; expressed; figures; buys; value; seller; purchased; debtor; settled; opposite; balancing; credit; expenses; contains; moneys.

## ECONOMY AND FRUGALITY.

**Economy** is the right and proper management of things To be frugal, is to use things rightly, and not waste or abuse them.

An old proverb says, Haste often makes waste, and waste brings want. To which may be added, Waste shuts up the hand of charity.

A wise man has said, Without frugality, none can be rich, and with it, very few need be poor.

A poor man in distress once went to the house of a wealthy man to ask assistance, or beg for alms. When he came to the door of the rich man's house, he heard him scolding a servant for wasting a piece of a candle. So he thought it an unlikely place to get any help, where so much displeasure was shown for the loss of a small piece of candle.

He however waited till the rich man came out, and then ventured to make known to him his distressed condition. On which, the rich man put his hand into his pocket, and, taking out a piece of gold money, equal in value to about five dollars, he gave it to the poor man.

The beggar was surprised at such a gift, and supposed the rich man had made a mistake, and given him more than he intended. Being too honest to take advantage of such a circumstance, he looked at the money—then at the rich man, and asked him if he had not made a mistake.

The rich man then inquired why he thought so? Because, said the poor man, when I came to the door, I heard so much fault found with the servant about a piece of candle.

The generous benefactor then told him that he had made

---

**Spell** economy; frugality; management; proverb; waste; charity; without; distress; wealthy; scolding; servant; candle; piece; displeasure; ventured; known; surprised; honest; circumstance; money; advantage; define it. Spell circumstance; servant; generous; benefactor; define it. Spell relation; fault; wasted; Philano mistake, but had given him what he intended; and added, "What I give, I give freely. But, in relation to my finding fault with the servant, it was because I very much dislike to see any thing wasted."

It has been reported of the late wealthy Stephen Girard, of Philadelphia, that when walking the streets, he would stop to pick up a nail; because he thought that nothing should be wasted which might be useful.

It is also said of that plain, humble man, John Woolman, of New Jersey, that when some person found fault with him for using so small a piece of paper, on which he drew some writing,—John mildly replied, "The paper is large enough for the purpose; and I never found any better rule in such cases, than enough."

If true frugality were observed by people generally, how much waste and extravagance would be prevented! and yet none of the real comforts of life would be lessened.

For want of prudence and good management, many become poor, who might otherwise live in comfort, and have enough to satisfy all the reasonable desires of an humble mind.

But frugality should always be connected with liberality, otherwise it may degenerate into selfish parsimony.

If economy and frugality were duly observed, many people might have wherewith to assist the poor and needy; but for want of this care, they often think they have nothing to spare for the relief of real objects of charity.

---

**delphia; wealthy; New Jersey; piece; writing; replied; enough; frugality; generally; extravagance; define it. Spell lessened; management; otherwise; reasonable; should; liberality; degenerate; parsimony; define it. Spell economy· define it. Spell wherewith; relief; real; charity.**

## PLEASING COMPARISONS.

How bright are the beams
  Of the heart-cheering sun,
As he daily pursues
  His glad journey above!
But brighter, far brighter
  The life of a child,
Who employs every hour
  In duties of love.

How sweet is the fragrance
  Of a morning in spring,
When the flowers are fresh,
  And the air is so mild!
But sweeter, far sweeter,
  The soft, gentle words
That flow from the lips
  Of a kind-hearted child.

When the motherly hen
  Calls her chickens around her,
'Tis pleasant to see them
  Quick hasten away;
But more pleasant it is
  To behold a dear child,
When its parents command,
  So cheerfully obey.

What a beautiful sight
  Is a garden of plants,
That, arranged in nice order,
  All flourish and thrive!

---

SPELL pleasing; comparisons; heart; cheering; pursues; journey; employs; duties; fragrance; define it. Spell flowers; kind-hearted;

More beautiful still
Is a family of love,
Where brothers and sisters
In harmony live.

O Thou best of all beings,
Who madest the world,
Every creature that lives,
Every object I see;
Oh! grant in thy mercy,
That all I behold
May instruct me each day
In my duty to thee.

## A PSALM OF DAVID.

O give thanks unto the Lord, for he is good; for his mercy endureth for ever.

Let the redeemed of the Lord say so, whom he hath redeemed from the hand of the enemy; and gathered them out of the lands, from the east, and from the west, from the north, and from the south.

They wandered in the wilderness in a solitary way; they found no city to dwell in. Hungry and thirsty, their soul fainted in them.

Then they cried unto the Lord in their trouble, and he delivered them out of their distresses: and he led them forth by the right way, that they might go to a city of habitation.

Oh! that men would praise the Lord for his goodness, and for his wonderful works to the children of men!

---

sweeter; chickens; pleasant; hasten; motherly; cheerfully; beautiful; arranged; harmony; every; creature; instruct.

Spell psalm; mercy; endureth; redeemed; enemy; gathered; south; wandered; solitary; thirsty; trouble; delivered; distresses;

For he satisfieth the longing soul, and filleth the hungry soul with gladness.

Such as sit in darkness, and in the shadow of death, being bound in affliction and iron; because they rebelled against the words of God, and contemned the counsel of the Most High. Therefore he brought down their heart with labour they fell down and there was none to help.

Then they cried unto the Lord in their trouble, and he saved them out of their distresses.

He brought them out of darkness and the shadow of death, and brake their bands in sunder.

Oh! that men would praise the Lord for his goodness, and for his wonderful works to the children of men.

For he hath broken the gates of brass, and cut the bars of iron in sunder.

Fools, because of their transgression, and because of their iniquities, are afflicted: their soul abhorreth all manner of meat, and they draw near unto the gates of death.

Then they cry unto the Lord in their trouble, and he saveth them out of their distresses. He sent his word, and healed them, and delivered them from their destructions.

Oh! that men would praise the Lord for his goodness, and for his wonderful works to the children of men! And let them sacrifice the sacrifices of thanksgiving, and declare his works with rejoicing.

They that go down to the sea in ships, that do business in great waters; these see the works of the Lord, and his wonders in the deep. For he commandeth, and raiseth the stormy wind, which lifteth up the waves thereof.

---

city; habitation; would; wonderful; satisfieth; gladness; shadow; affliction; rebelled; continued; counsel; brought; labour; cried; shadow; brake; would; children; transgression; iniquities; trouble; abhorreth; distresses; delivered; destructions; praise; wonderful; sacrifices; thanksgiving; rejoicing; business; commandeth; raiseth;

They mount up to the heaven, they go down again to the depths; their soul is melted because of trouble. They reel to and fro, and stagger like a drunken man, and are at their wit's end.

Then they cry unto the Lord in their trouble, and he bringeth them out of their distresses. He maketh the storm a calm, so that the waves thereof are still.

Then they are glad, because they be quiet; so he bringeth them unto their desired haven.

Oh! that men would praise the Lord for his goodness, and for his wonderful works to the children of men!

Let them exalt him also in the congregation of the people, and praise him in the assembly of the elders.

He turneth rivers into a wilderness, and the water-springs into dry ground,—a fruitful land into barrenness, for the wickedness of them that dwell therein.

He turneth the wilderness into a standing water, and dry ground into water-springs: and there he maketh the hungry to dwell, that they may prepare a city for habitation; and sow the fields, and plant vineyards, which may yield fruits of increase. He blesseth them also, so that they are multiplied greatly, and suffereth not their cattle to decrease.

Again they are minished and brought low, through oppression, affliction and sorrow. He poureth contempt upon princes, and causeth them to wander in the wilderness where there is no way. Yet setteth he the poor on high from affliction, and maketh him families like a flock.

The righteous shall see it and rejoice, and all iniquity shall stop her mouth. Whoso is wise, and will observe these things, even they shall understand the loving-kindness of the Lord.

---

depths; stagger; drunken; heaven; bringeth; distresses; desired; haven; praise; exalt; congregation; people; assembly; rivers; water-spring; fruitful; barrenness; wilderness; dwell; habitation; city; fields; vineyards; yield; greatly; suffereth; cattle; decrease; minished; oppression; wonder; families; righteous; iniquity.

## TENDERNESS TO ANIMALS.

I would not enter on my list of friends
(Though grac'd with polish'd manners and fine sense
Yet wanting sensibility) the man
Who needlessly sets foot upon a worm.
An inadvertent step may crush the snail
That crawls at evening in the public path;
But he that has humanity, forewarn'd,
Will tread aside, and let the reptile live.
The creeping vermin, loathsome to the sight,
And charg'd perhaps with venom, that intrudes,
A visiter unwelcome, into scenes
Sacred to neatness and repose,—the alcove,
The chamber, or refectory,—may die.
A necessary act incurs no blame.
Not so, when held within their proper bounds
And guiltless of offence, they range the air,
Or take their pastime in the spacious field;
There they are privileg'd; and he that hunts,
Or harms them there, is guilty of a wrong,—
Disturbs the economy of Nature's realm,
Who, when she form'd, design'd them an abode.
The sum is this.—If man's convenience, health,
Or safety interfere, his rights and claims
Are paramount, and must extinguish theirs;
Else they are all,—the meanest things that are,—
As free to live, and to enjoy that life,
As God was free to form them at the first,
Who in his sov'reign wisdom made them all.

---

Spell sensibility; inadvertent; define it. Spell crawls; humanity; reptile; vermin; loathsome; venom; unwelcome; refectory; define it. Spell necessary; guiltless; spacious; field; privileged; economy; convenience; health; paramount; define it. Spell extinguish; define it. Spell else; sovereign; dishonoured; budding; unrestrained; luxuriant; growth; righteous; limitation; guilty; conscious; outrage.

Ye, therefore, who love mercy, teach your sons
To love it too. The spring-time of our years
Is soon dishonour'd and defil'd in most,
By budding ills, that need a prudent hand
To check them. But, alas! none sooner shoots,
If unrestrain'd, into luxuriant growth,
Than cruelty,—most dev'lish of them all.
Mercy, to him that shows it, is the rule
And righteous limitation of its act,
By which Heaven moves, in pard'ning guilty man;
And he that shows none, being ripe in years,
And conscious of the outrage he commits,
Shall seek it, and not find it in his turn. COWPER.

## GASES.

THE air that we breathe, and that surrounds the earth on which we live, is called the atmosphere.

Gas is the name that is given to any fluid substance, in the form of air, which continues to exist in that state.

The atmospheric air is composed of two parts, or two kinds of gas, called oxygen and nitrogen.

If we suppose the atmosphere to be made up of one hundred parts, then twenty-one of those parts are oxygen, and seventy-nine are nitrogen gas.

It is found that the oxygen gas is that part of the air we breathe, which supports animal life; and by means of the oxygen gas, the fire burns, a candle burns, and the coals keep red-hot.

---

SPELL breathe; surrounds; atmosphere. What is the atmosphere? Spell fluid; define it. Spell atmospheric; oxygen; nitrogen; atmosphere; define it. Spell animal; candle; breathing; nitrogen; hydrogen; obtained; distillation; brilliant; define it. Spell carbonic; caverns. How many parts of common air are oxygen? nitrogen?

The other part of the air, called nitrogen gas, is not fit for the support of life, and a candle will not burn in it alone.

Hydrogen gas is obtained by the distillation of coal. As it burns with a brilliant light, when coming in contact with atmospheric air, it is used for lighting the streets of large cities, and also for lighting stores, halls, and parlours.

Carbonic acid gas is often found in damp mines, caverns and the bottoms of wells, and sometimes in damp cellars. I is fatal to animal life, and it extinguishes fire. A candle will not burn in it a minute.

Carbonic acid gas is heavier than common air; and therefore remains nearer the ground, or the bottom of cellars, and in the lower part of wells.

In warm, moist weather, this dangerous gas is often found in wells: it is also found in vaults and cellars where wine, cider, or beer is fermenting.

Before a person goes down into a well at any time, or into a mine, vault, or cellar where liquor is fermenting, a lighted candle should be exposed to the air, or let down into the well by a rope or string. If there is carbonic acid gas in the well, vault, or cellar, the candle will go out as soon as it comes in contact with the gas. It is then unsafe for a person to go down, until the carbonic acid is removed.

This hurtful and dangerous gas is also produced by burning charcoal. Hence, people should never sleep in a close room, where a pot of charcoal is burning. Cases have occurred, where persons thus exposed have been found dead in the morning.

---

Spell cellars; extinguish; define it. Spell carbonic; acid; heavier; moist; dangerous; vaults; liquor; fermenting; dangerous; charcoal; exposed; accidents; acid; otherwise; caution. What is the atmosphere? What is a gas? How many parts of a hundred, of air, are oxygen? how many of nitrogen? What kind of gas is used for lighting streets and houses? Where is carbonic acid gas found? Will fire burn in it? What should be done before going down into a well? Is it safe to sleep where charcoal is burning?

Many sad accidents, from carbonic acid, have happened by men going down into wells, or otherwise coming in contact with this gas, for want of attending to the above caution.

## A PATIENT, PEACEABLE TEMPER AND CONDUCT RECOMMENDED.

In every station, and in every condition of life, public, private, and domestic, occasions of irritation sometimes occur.

If we give way to impatience and anger, we throw away many hours or days of happiness, which a little more patience would have allowed us to enjoy: and we put it in the power of others to make us unhappy.

Patience under provocations, and at all times, is our interest as well as duty. Let us, therefore, cultivate a patient and peaceable disposition, until it becomes the habitual temper of our minds.

In domestic life, especially, all the virtues of an amiable temper find an ample range: for there the real character of every person displays itself.

The forms and customs of the world may disguise people when they are abroad. But within our own families, we are known to be what we really are.

In all our intercourse and dealings with others, let us maintain a peaceable, candid, gentle, and friendly temper. By this means, much unhappiness, prejudice, and unkind feelings and conduct may be avoided, and peace and tranquillity preserved.

---

SPELL patient; peaceable; condition; domestic; occasions; irritation; impatience; provocations; cultivate; disposition; habitual; especially; amiable; character; disguise; define it. Spell maintain; intercourse; friendly; prejudice; define it. Spell tranquillity; write:

But if occasions of dispute and offences should arise, never write a letter, or send a note to any person, towards whom you have any feeling of anger or ill-will. For if you write on any subject connected with these feelings, you are in danger of doing harm, and increasing the breach of unity.

Your letters may also be shown to others, who may see your weakness and read your angry feelings, to your loss of character in their view.

People often expose themselves, by speaking to others under the influence of passion or ill-will,—even when they may think themselves very careful of their words.

But even these exposures of their tempers, being but wind, may soon pass away and be forgotten; while those feelings, being written on paper, may continue long, and be often read, to the wounding of the peace and harmony of society.

If trials and provocations to impatience, anger, and ill-will, should occur, (and who can live in society without such trials?) if we value our own peace and comfort, let us try to keep calm and quiet.

To aid us in thus possessing ourselves in patience and calmness, let us be as silent as possible from uttering hasty words, or making tart replies, or even speaking loud or harsh; for these only add fuel to the fire of strife and contention.

How often, after the storm of excitement and passion is a little over, have many persons, in the cool of reflection, bitterly repented of their own rash and hasty expressions, when now too late to be recalled!

How often it is found, on giving way to anger or impatience, that the tongue is an unruly evil, full of deadly poison,

---

increasing; breach; character; view; themselves; exposures; forgotten; written; wounding; society; provocations; possessing; possible; harsh; contention; excitement; reflection; expressions; recalled; tongue; poison; setteth; maxim; answer; grievous; city.

to destroy peace and harmony; or like a wild fire that setteth on fire the course of nature!

Let us therefore ever keep in mind this wise maxim of king Solomon; "A soft or mild answer turneth away wrath; but hasty or grievous words stir up anger." And again, "He that is slow to anger is better than the mighty, and he that ruleth his own spirit, than he that taketh a city."

## LOOK THROUGH NATURE UP TO NATURE'S GOD.

Hast thou beheld the glorious sun,
Through all the sky his circuit run,
At rising morn, at closing day,
And when he beamed his noontide ray?

Say, didst thou e'er attentive view
The ev'ning cloud or morning dew?
Or, after rain, the wat'ry bow
Rise in the east, a beauteous show?

When darkness had o'erspread the skies,
Hast thou e'er seen the moon arise;
And with a mild and placid light,
Shed lustre o'er the face of night?

Hast thou e'er wander'd o'er the plain,
And viewed the fields, and waving grain,
The flow'ry mead, and leafy grove,
Where all is melody and love?

Hast thou e'er trod the sandy shore,
And heard the restless ocean roar,
When roused by some tremendous storm,
Its billows roll in dreadful form?

Hast thou beheld the lightning's stream,
Through night's dark gloom with sudden gleam?

---

**Spell** glorious; circuit; define it. Spell noontide; attentive; view; beauteous; overspread; placid; define it. Spell lustre; define it.

While bellowing thunder's awful sound
Roll'd rumbling through the clouds profound.

Hast thou e'er felt the cutting gale,
The sleety shower, the biting hail?
Beheld bright snow o'erspread the plains;
The water bound in icy chains?

Hast thou the various beings seen,
That sport along the valley green;
That sweetly warble on the spray,
Or wanton in the sunny ray;

That shoot along the briny deep,
Or under ground their dwellings keep;
That through the gloomy forests range,
Or frightful wilds and deserts strange?

Hast thou the wond'rous scenes survey'd,
That all around thee are display'd?—
And hast thou never rais'd thine eyes
To HIM who caus'd these scenes to rise?

'Twas GOD,—who form'd the concave sky,
And all the shining orbs on high;
Who gave the various beings birth,
That people all the spacious earth.

'Tis HE that bids the tempests rise,
And rolls the thunder through the skies,
His voice the elements obey;
Through all the earth extends his sway.

His goodness all his creatures share;
But man is his peculiar care;—
Then, while they all proclaim his praise,
Let man his voice the loudest raise.

---

**Spell flowery; melody; ocean; tremendous; define it. Spell billows define it. Spell gleam; rattling; profound; valley; warble; define it Spell wanton; dwellings; wondrous; surveyed; scenes; concave, fine it. Spell spacious; elements; creatures; peculiar; define it.**

## MULES.—*Anecdote.*

A MULE is a quadruped of a mixed breed, between a jackass and a mare.

Mules are commonly less in size than horses; but more hardy and able to bear fatigue. They are used for drawing loads, or carrying burdens on their backs.

In some countries, they are almost the only animals used in travelling, and carrying baggage; especially in crossing steep and high mountains, and over difficult roads.

People who live in the United States, where canals, and rail-roads, and turnpikes, and other good roads abound, can hardly form a correct idea of the labour and danger of crossing that immense chain of high mountains, called the Andes, in South America.

The roads, or rather paths by which travellers cross these mountains, are called *passes;* and the journey is generally made by mounting the back of the patient and sure-footed mule.

The following account of part of a journey across the Andes, is related by a recent traveller in South America:

"As I was looking up at the region of snow, and as my mule was scrambling along the steep of rocks, the captain overtook me, and asked me if I chose to come on with him. He said he was going to look at a very dangerous part of the road, which we were approaching, in order to see if it were passable, before the mules came to it.

I followed him; and in half an hour we arrived at the spot. It is the worst pass in the whole road over the Andes. The mountain above appeared almost perpendicular, and

---

SPELL anecdote; define it. Spell quadruped; fatigue; countries; travelling; baggage; especially; canals; idea; immense; define it. Spell travellers; journey; generally; patient; region; scrambling; overtook; dangerous; approach; passable; perpendicular; define it.

below, it was one continued slope down to a rapid torrent that was raging underneath.

The surface of the ground was covered with loose earth and stones, which had been brought down by the waters from above. The path goes across this slope, and is very bad for about seventy yards; being only a few inches wide.

But the place of greatest danger is a spot where the water, which comes down from the top of the mountain, either washes the path away, or covers it over with loose stones.

In some places along this difficult pass, the rock almost touched our shoulders, on one side, while the precipice was almost directly under the opposite foot; and high overhead there were a number of loose stones, which appeared as if the slightest touch would send them rolling down into the torrent beneath, which was foaming and running with great violence.

As soon as we had crossed this difficult pass, which was only about seventy yards long, the captain told me it was a very bad place for baggage-mules. He further said that four hundred had been lost there, and that we should probably lose one.

The drove of mules now came in sight, one following another in the narrow path. A few of them were carrying no burdens; but the rest were either mounted with riders, or heavily loaded with baggage.

As soon as the leading mule came to the beginning of the difficult pass, he stopped, as if unwilling to proceed; and of course all the rest stopped also. He was the finest mule we had, and on that account, had twice as much to carry as any of the others.

---

**Spell rapid; raging; underneath; surface; covered; across; greatest; mountain; washes; difficult; touched; shoulders; precipice; define it. Spell opposite; overhead; touch; slightest; rolling; beneath; foaming; torrent; define it. Spell violence; baggage; probably**

With his nose to the ground, he seemed to be smelling his way, and then walked slowly on; often changing the position of his feet, if he found the ground would not bear, until he came to the worst part of the pass, when he stopped. But the drivers threw stones at him, and he moved along the path in safety, while several others followed.

At length a young mule that carried a portmanteau, with two large sacks of provisions and many other things, in passing the bad point, struck his load against the rock, which knocked his two hind legs over the precipice, and the loose stones immediately began to roll away from under them.

His fore-legs were still upon the narrow path; but he had no room to put his head there. So he placed his nose on the path to his left side, and appeared to hold on by his mouth.

But his perilous fate was soon decided by a loose mule that, in walking along after him, knocked his nose off the path. His balance being thus destroyed, the poor creature instantly commenced a fall, head over heels, that was really quite terrific.

With all his baggage firmly lashed to him, he rolled down the steep slope, until he came to a part which was perpendicular. He then seemed to bound off; and, turning round in the air, he fell into the deep and rapid torrent on his back and upon his baggage, and instantly disappeared.

To any other animal than a mule, this fall must have been fatal. He was carried down the stream in spite of all his efforts; and, turning the corner of a rock, he was given up for lost.

---

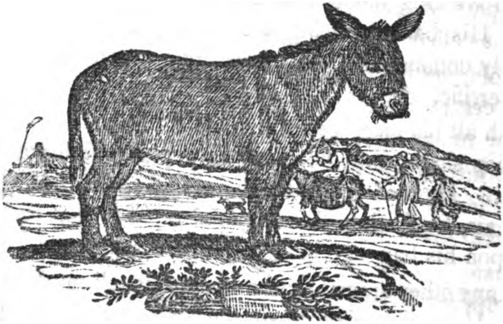
**following; carrying; either; heavily; beginning; unwilling; twice; smelling; changing; position; define it. Spell threw; several; length; portmanteau; provisions; knocked; point; precipice; define it. Spell immediately; roll; appeared; perilous; decided• balance; destroyed; instantly; commenced; really; terrific; define it.**

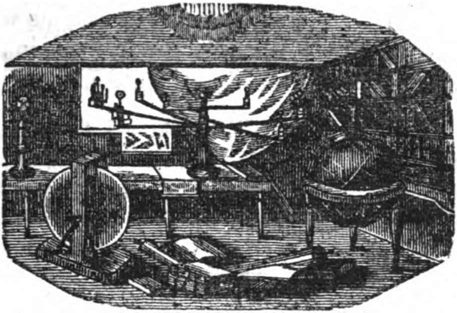
After some time, I saw at a distance a solitary mule walking on towards us. We soon perceived that he was the same whose dreadful fall we had just before witnessed, and in a short time he came up to us, and joined his comrades.

He was dripping wet; his eyes looked dull, and his whole countenance was dejected; but none of his bones were broken. He was very little cut, and his sound appearance was almost incredible, after such a terrible accident."

---

Spell baggage; perpendicular; define it. Spell rapid; disappeared; animal; carried; solitary; define it. Spell perceived; comrades countenance; dejected; appearance; incredible; define it. Spell accident.





## ASTRONOMY.

**Science** is the knowledge of any thing, founded on certain principles, and established by sufficient proofs or demonstrations.

The science of astronomy treats of the stars, and what are called the heavenly bodies.

That part of astronomy which alludes to the sun and the planets, is called the *solar system.*

The solar system considers the sun as being placed in or near the centre, and the planets (with their moons) moving round the sun in circular or elliptical orbits.

There are seven planets which move round the sun in different lengths of time, according as they are nearer or farther from that luminary.

The names of the planets are Mercury, Venus, the Earth, Mars, Jupiter, Saturn, and Herschell. To which may be added four smaller ones, called asteroids, namely Vesta, Juno, Pallas, and Ceres.

The sun is computed to be more than a million times larger than the earth on which we live. It is an immense

---

**Spell** science; knowledge; principles; sufficient; demonstrations; astronomy; system; centre; circular; elliptical; lengths; luminary; define it. Spell Mercury; Jupiter; Saturn; Herschell; asteroids globe, or body of light. The rays or particles of light fly from the sun in rapid succession, and in every direction. The sun thus gives light to all the planets, and to their moons.

The diameter of the sun is reckoned to be more than eight hundred and eighty-five thousand miles. Surely nothing but the unlimited power of God could produce such an immense globe of light!

## THE PLANETS.

Planets are dark bodies or globes, which receive their light from the sun.

**Mercury**, the planet nearest to the sun, is about thirty-seven millions of miles from it.

Mercury is the smallest of all the seven planets. It revolves round the sun in about three months, and turns round on its own axis once in about twenty-four hours.

**Venus** is about sixty-eight millions of miles from the sun. It turns round on its axis in about twenty-four hours; making its days and nights about as long as ours.

Venus moves round the sun in its orbit, in seven months and a half, which makes the length of its year.

When Venus is seen in the east before the sun rises, it is called the *morning star;* but when it is seen in the west after sun-set, it is called the *evening star*. It appears larger than any of the planets, because it is nearer to us: but its diameter is less than eight thousand miles.

The **Earth** is ninety-five millions of miles from the sun,

---

million; immense; define it. Spell succession; direction; diameter; define it. Spell reckoned; unlimited; rapid; system; bodies; solar; established; receive; Mercury; millions; axis; Venus; orbit define it. Spell diameter; travels; minute; circumference; define it.

and travels round him in three hundred and sixty-five days and a quarter, which makes our year.

The earth moves in its orbit round the sun, at the rate of more than a thousand miles every minute; that is, about sixty-four thousand miles in an hour.

The diameter of the earth is about eight thousand miles, and its circumference about twenty-five thousand. It turns round on its own axis once in twenty-four hours, which makes day and night.

How great, how good, how wise, and powerful must be that Almighty Being who created the earth, the sun, the moon, and all the planets, and who sustains and preserves them all, in their rapid courses through the sky!

While contemplating on these stupendous works of the great Creator, with wonder and astonishment, let love and gratitude and adoration flow in our hearts, in the assurance that amongst all his mighty works, he remembers and regards every humble little child, and all the creatures he has made.

MARS is next the earth, and is one hundred and forty-four millions of miles from the sun. It revolves round the sun once in about two years, and turns on its own axis once in about twenty-four hours.

Mars is a little more than four thousand miles in diameter; and it moves in its orbit round the sun, at the rate of about fifty-five thousand miles in an hour.

Mars is of a dusky red colour, and not so bright as Venus or Jupiter.

The asteroids come next to Mars in the solar system; but they are so small as seldom to be seen with the naked eye, without a telescope.

---

Spell powerful; Almighty; created; sustains; rapid; contemplating courses; stupendous; define it. Spell astonishment; gratitude; adoration; assurance; hearts; amongst; creatures; colour; system;

JUPITER is about eighty-nine thousand miles in diameter; being upwards of a thousand times larger than the earth. It is four hundred and ninety millions of miles from the sun, and it has four moons revolving round it. These moons, as well as Jupiter, receive their light from the sun, and reflect it in the same manner as our moon does.

Jupiter moves round the sun in its orbit, once in about twelve of our years. Jupiter's year is therefore twelve times as long as ours; but its days are shorter than ours, for it turns round on its axis in less than ten hours.

Jupiter is the brightest planet next to Venus, especially when it is nearly opposite to the sun.

The next planet in the solar system is SATURN, which is at the vast distance of nine hundred millions of miles from the sun.

Saturn performs its journey round the sun in about thirty years; its year is therefore as long as thirty of ours.

The diameter of Saturn is computed to be about seventy-eight thousand miles, being next to Jupiter in size.

Besides seven moons which move round Saturn in different lengths of time, it is also surrounded by an immense ring, or rather by two rings of a bright appearance. These rings also turn round the planet, at some distance from it, from west to east, in about ten hours, which is nearly the same time that Saturn turns on its own axis.

HERSCHELL, the seventh planet, is at the immense distance of eighteen hundred millions of miles from the sun. Its year, or the time in which it performs its revolution round the sun, consists of about eighty-four of our years.

There are six moons, or satellites, which move round this

---

**asteroids; telescope; revolving; receive; especially; opposite; Saturn; journey; lengths; surrounded; immense; bright; planet appearance; distance; Herschell; revolution; satellites; comets**

planet; but it is not yet known how long Herschell is in turning round on its own axis.

Comets, like the planets, also revolve round the sun; but as they move in very eccentric ellipses, they are visible to us only when they are in that part of their orbit nearest to the sun.

Comets, after passing round the sun, often have a tail or beard which reflects light—but their motion is so rapid, that they soon become invisible to us.

All the planets, with their moons, are supposed to be bodies like our earth; on which there may be innumerable multitudes of men, women, and children, and various other animals and living creatures, enjoying life and happiness.

It is supposed by some, that those planets nearest the sun, have a greater portion of light and heat than those which are remote, or farther off. Be this as it may,—there can be no doubt that the benevolent Creator, in forming worlds of matter, and diffusing life and happiness among his creatures, has wisely adapted them to their habitations, or places of abode, and bountifully supplied them with proper degrees of light and heat, and all the blessings of his goodness, needful for their state of existence, and for their comfort and happiness.

---

**eccentric; ellipses; visible; invisible; innumerable; multitudes; various; women; creatures; enjoying; benevolent; diffusing; adapted; habitations; bountifully; existence; happiness.**

## THE GOOD SAMARITAN.

In the scriptures, there are examples of a peculiar and striking method of giving advice, counsel, or reproof, by parables. This method is level to the lowest capacity of understanding, as well as adapted to the highest order of society.

In the New Testament, we have an example of this kind, when a student of the Jewish law asked the question, "Who is my neighbour?" in reference to the command, Thou shalt love thy neighbour as thyself.

Ever disposed to teach, and not to disgust, and to instruct and inform the inquiring mind, our blessed Lord replied to his question, by way of parable, in a manner as familiar and amiable as it was well adapted to the purpose.

A certain man going down from Jerusalem to Jericho, fell among thieves. Not content to rob him of his treasure, they stripped him of his garments, wounded him with great barbarity, and left him half dead.

Soon after this shocking event, a traveller happened to

---

**Spell** Samaritan; scriptures; peculiar; parables; define it. Spell capacity; adapted; define it. Spell neighbour; reference; inquiring; familiar; amiable; Jerusalem; thieves; treasure; stripped; barbarity; traveller; relief; compassion; manifest; qualities; weltercome along that very road; and what rendered him more likely to afford relief to the sufferer, he was a priest,—a minister of religion; one who taught others the lovely lessons of mercy, compassion, and charity.

It was therefore to be expected that he would manifest these amiable qualities in his own practice; but when he saw him lying on the cold ground, and weltering in his own blood, he took no further notice of him, but passed by on the other side, and went his way.

Soon after he was gone, a Levite came along. This man came nearer, and when he was at the place, looked on the miserable object. But though every bleeding wound seemed to plead for his pity and his help, yet this minister of the sanctuary neither spoke a word of comfort, nor moved a hand to aid him, but passed by on the other side, and left him.

Next came along a Samaritan, one of the nation that was despised and hated by the Jews. Though the priest had withheld his pity from one of his own brethren, and though the Levite had neglected a suffering and expiring fellow-creature,—yet as soon as the Samaritan came where he was, and saw him in that distressed condition, he had pity on him.

He went to him with the feelings of kindness;—bound up his bleeding wounds;—and poured in the oil and the wine which he carried for his own refreshment. He raised up the mangled stranger, and set him upon his own beast; and with all the tenderness of a brother, carefully conducted him to an inn.

Here he tarried with him all night, and nursed him. The next morning, he gave the innkeeper money for the present

---

ing; define it. Spell miserable; sanctuary; neither; despised. priest; withheld; brethren; neglected; expiring; define it. Spel. distressed; poured; refreshment; mangled; carefully; tarried money; expenses; guest; recov- [illegible] leaving; further; addressed expenses of his guest, and gave him a strict charge to take care of him, and omit nothing that might conduce to his comfort and his recovery.

Nor was this all: the Samaritan, on leaving the inn, promised to pay all further expenses that might occur for his board, lodging, and cure, in these words, addressed to the host, "Whatsoever thou spendest more, when I come again, I will repay thee."

Here is a picture of the most noble and active benevolence; which is not confined to friends, relatives, and acquaintances;—a charity that excludes not even enemies and strangers from its offices of love.

But the young lawyer with this picture before him, was called upon to give his judgment in the case, and therein to answer his own question himself. "Which now of these three, thinkest thou, was neighbour unto him that fell among thieves?"

The conviction was obvious, and the answer of the lawyer was a plain one: "He that showed mercy on him."

This correct decision drew forth, in a few words, the most important lesson of advice and instruction for the regulation of his future conduct: "Go thou, and do likewise."

---

whatsoever; picture; define it. Spell benevolence; acquaintances; relatives; excludes; define it. Spell strangers; offices; lawyer; therein; question; neighbour; conviction; obvious; define it. Spell decision; important; regulation.

## TELESCOPE AND MICROSCOPE.

A TELESCOPE is a tube or hollow cylinder, made of wood, of brass, or other metallic substance. In this tube, glasses, called lenses, are placed in such a manner that by looking through them, objects at a great distance are magnified, so as to appear much larger and nearer than when seen only by the naked eye.

A lens is a circular glass, ground and polished in such a form as either to collect or spread the rays of light which pass through it.

A simple convex lens has one side flat, and the other convex, or rounding, like part of a globe.

A double convex lens is convex or rounding on both sides. A plane concave lens is flat on one side, and concave or hollowing on the other. Of one or other of these lenses, the glasses of spectacles, and those used in making telescopes or spy-glasses, are mostly formed.

---

**SPELL telescope; cylinder; metallic; define it. Spell lenses; mirrors. What is a mirror? Spell magnified; define it. Spell circular; polished; define it. Spell convex; define it. What is a lens? a convex lens? a double convex? a concave? Define concave.**

But there are two kinds of telescopes, called *refracting* and *reflecting*. A common spy-glass, or refracting telescope, consists of a convex glass, placed in one end of the tube, and a concave lens, or eye-glass at the other.

The reflecting telescope consists of mirrors, called specula, or metallic reflectors, attached to the tube in the place of lenses. Of this kind was the famous telescope of Doctor Herschel; by means of which he discovered the planet that bears his name, and many other facts in relation to the stars and planets.

It has also been by means of the telescope that the rings of Saturn, the belts of Jupiter, and the moons that revolve round several of the planets, have been discovered. Other important objects connected with the science of astronomy, have been ascertained by the aid of this wonderful optical invention.

By the aid of the telescope, the moon appears to be full of mountains and valleys;—a number of dark spots are sometimes observed on the surface of the sun; the moons of the planets are found to move round them, in the same manner as our moon goes round the earth; and the milky-way is discovered to be composed of a vast number of stars, which cannot be distinctly seen by the naked eye.

A MICROSCOPE is an instrument used for viewing small objects that are very near.

There are three kinds of microscopes: the single; the compound, or double; and the solar.

The single microscope is only a small double convex lens placed in a frame. If a small object be placed at a short

---

Spell spectacles; refracting; define it. Spell reflecting; define it. Spell attached; metallic; telescope; define it. Spell Herschel; discovered; define it. Spell Jupiter; revolve; important; connected; astronomy. What is astronomy? define it. Spell microscope; what is it? Spell viewing; solar; define it. Spell opposite; magnified images; wonderful; curious; darkened; mirror; admitted; window.

distance from it at a point called the *focus*, and the eye at the same distance on the opposite side, it will appear to be greatly magnified, or enlarged.

A compound microscope is formed of a tube, in which there are placed an object-glass and one or more eye-glasses. The images of objects viewed through these glasses, are magnified a great number of times.

By means of the microscope, a vast number of little animals have been discovered, which cannot be seen by the naked eye. It opens a wonderful field of curious objects in the works of creation, and shows some of the minute parts of the world of matter.

A solar microscope can only be used in a darkened room when the sun shines. It is composed of a tube, a mirror, a convex lens, and a single microscope.

The sun's rays being admitted through a small opening in a door, or window-shutter, are reflected by the mirror through the tube upon the object to be magnified. The image of this object is thence thrown through the convex lens upon a wall, sheet, or other surface at a proper distance.

The solar microscope enlarges objects to an almost incredible size; but it cannot be applied to so many purposes as the other two kinds.

Thousands and millions of minute objects and living creatures, which cannot be seen by the naked eye, are rendered visible by means of the optical instrument called a microscope.

If the power, wisdom, and goodness of God, are displayed to the mind of one who views his handiwork in the hea-

---

**shutter; tube; what is a tube? Spell enlarges; incredible; define it. Spell purposes; millions; define it. Spell minute; define it. Spell visible; define it. Spell optical; define it. Spell and define displayed planetary; amazing; exhibited; diffusion; myriads; microscope.**

venly bodies and planetary worlds, as seen through a telescope,—not less amazing and wonderful is the display of the same power, wisdom, and goodness, as exhibited in the diffusion of life and happiness among myriads of the minute parts of his creation, as viewed through the microscope.

## TRANSFORMATIONS OF INSECTS.

All winged insects, and many of those which are without wings, have to pass through several changes before they arrive at a state of perfection.

A caterpillar is hatched from an egg, laid by the parent some time before. Having jaws and teeth, it soon begins to eat; and grows to be a rough, hairy animal, having fourteen feet.

All caterpillars cast or change their skins according to their species; some two, some three, and others four times, or more.

A day or two before this change, or casting the skin, occurs, the caterpillars take no food. They seem dull and inactive; and in a while fix themselves in one place, where they bend their bodies, and twist themselves, till they escape from their old skin, and leave it behind them.

The skin, after it is cast, remains so entirely the figure of the caterpillar, in the shape of the head, teeth, legs, colour, and hair, that it is often taken for the animal itself.

When caterpillars attain their full growth, they pass into another form, called the chrysalis state. When about to change into this condition, they choose a proper place where they may remain unmolested and secure from their enemies.

---

Spell transformation; define it. Spell winged; several; perfection; caterpillar; hatched; rough; fourteen; species; entirely; figure; colours; inactive; awhile; themselves; bodies; growth; attain; they; chrysalis; their; condition: choose; unmolested; define it.

Some kinds of caterpillars, such as the silk-worm, and many others, spin silken webs or cocoons round their bodies, and therein conceal themselves. Others leave the plants or trees on which they had fed, and hide themselves in little cells which they make in the earth.

Some caterpillars when about to change into the chrysalis state, cover their bodies with a mixture of earth and silk, and hide themselves in a loose soil. Others form a case round their bodies of a kind of gummy matter for protection. Some retire into holes of walls, or other crevices, or into decayed wood, where they may remain secure during their chrysalis sleep.

Again, some species suspend themselves to the twigs of trees, or wind themselves up in the leaves. Others attach their tails, by a glutinous matter, to walls, trees, or shrubs, with their heads higher than their bodies, and spin a rope round their middle to keep them from falling.

Many other ingenious and curious methods are used by caterpillars, to protect themselves during this helpless, weak, and inactive chrysalis state; which sometimes continues for eight or nine months, and sometimes only a few weeks, or days.

While in this state, the animal eats nothing, is unable to move, and seems not to possess any powers of life. It appears to have neither legs nor wings, nor shape of worm or insect.

At a proper season of the year, the case, cocoon, or shield of the chrysalis, is burst asunder, or eaten through by its inhabitant, and the butterfly or winged insect comes forth in all its beauty.

---

Spell enemies; caterpillars; cocoons; therein; conceal; bodies; protection; crevices; decayed; species; suspend; define it. Spell attach; define it. Spell glutinous; ingenious; inactive; continues; neither; shield; chrysalis; define it. Spell asunder; inhabitant;

Its members, formerly soft, and folded up in its envelop, now become strong, expanded, and active.. It now has six springy legs, and two or four wings, often of beautiful variegated colours, with which it is able to mount up and fly through the air.

Instead of the teeth or pincers of the caterpillar, it now has a trunk, or long proboscis, by which it sucks the sweet juices of the flowers; and, instead of a few smooth eyes, it is now furnished with thousands.

Thus, that little animal which, a few months or a few weeks ago, was considered a filthy or hairy worm, on which the delicate eye would loathe to look;—that which crawled on the earth, and lived on herbage for a season;—that which, when full grown, wound itself up in a cocoon or shield, and became torpid, inactive, and apparently dead, while passing through the wonderful changes of the chrysalis state; that same little animal at length escaped from its curious tomb or shell, and became an insect, clothed with beauty, and furnished with wings and plumage, by means of which it could mount into the air, and fly with rapidity, so as to set at defiance the horse and his rider.

But the perfect insect, having thus passed through its various transformations, remains to feed on sweets and flutter in the air but a short time, or a few months at most. It lays its eggs, and leaves them to be hatched by the heat of the weather, to become a new generation of caterpillars the ensuing year, and then dies.

---

butterfly; beauty; envelop; define it. Spell expanded; define it. Spell variegated; define it. Spell pincers; proboscis; define it. Spell juices; furnished; delicate; loathe; crawled; generation herbage.

## NATURAL HISTORY OF BEES.

The working bee, by God instructed, knows
Where op'ning flowers their balmy sweets disclose.
She, with the sun, her daily task renews,
Flies o'er the plain, and sips the early dews:
Each blooming flower supplies her willing toil,
And the full hive contains the luscious spoil.

A bee-hive is a house for bees to live in. It is sometimes made of straw, but mostly of boards in the form of a box: to which it is easy to add glass windows, through which the bees may be seen at their work.

When a swarm, or family of bees is put into a hive, it is composed of three kinds or classes; the queen bee, the drones, and the working bees. Some divide the workers into two classes, called the wax-workers and the nurse-bees.

The queen bee is the mother of the whole family, and she governs all the other bees. But they all appear to love her very much; and they wait upon her with marks of great respect and kindness. They supply her wants, and follow her as a guard wherever she goes.

When a swarm of bees enters a new hive which is hollow and empty, they soon want cells or combs in which to raise young bees, and store their honey. These combs are made of wax, which is obtained in this manner: For about fifteen or twenty hours, the wax-workers hang in rows or clusters from the top of the hive inside, like a string of beads, one clinging to the legs or feet of another.

While they remain in this quiet state, the wax is formed out of the honey they had eaten, and appears in thin cakes,

---

Spell bees; instructed; balmy; luscious; swarm; queen; classes guard; wherever; honey; combs; obtained; clinging; scales; edges like scales, at the edges of the rings which case their bodies; making them look as if edged with a white substance.

At length one of these wax-workers leaves the rest, and chooses a place in the top of the hive, where she begins to lay the foundation of a comb. This she does by taking from her body a scale of wax, with her claw; and using her tongue as a trowel, she spreads it, and fastens it to the wood, or top of the hive.

Thus proceeding with all the wax about her, she then walks off, and her comrades follow her example, till all their wax is deposited in a kind of rough wall.

Another set of working bees then come forward, and scoop out portions of this wax, with which they form cells on each side of the wall. A third set of workers then finish the cells by using a kind of gummy substance, and drawing their mouths and their bodies over them, again and again, until they are polished smooth.

Bees appear not only to understand economy, but also to be very frugal in their use of the wax. Hence the cells are made with six sides, called hexagons, as taking the least wax, and occupying the least space possible. It shows a wonderful instinct, or knowledge, implanted in these little insects by the Creator himself. Nor is this the only display of His wisdom and goodness among these industrious creatures, but throughout their operations there is a skill and harmony apparent, which indicate a divine origin.

After a number of rows of cells, all exactly of a size, are finished on the first comb, they proceed in the same manner

---

**substance; length; chooses; classes; foundation; tongue; trowel; spreads; fastens; proceeding; comrades; define it. Spell example; deposited; define it. Spell rough; scoop; drawing; bodies; polished; smooth; understand; economy; define it. Spell frugal, and define it. Spell hexagon and define it. Spell occupying; possible; instinct; knowledge; display; industrious; throughout; skill; apparent; indicate; define it. Spell origin, and define it. Spell exactly; hanging**

to begin and build other combs and cells; all hanging from the roof, and just far enough apart for the bees to pass each other, as in a street or alley.

As soon as the cells are ready, the queen begins to lay eggs in them; and she deposits only one egg in each cell. In a day or two a little worm is hatched, that looks like a little maggot rolled into a ring. Now begins a fresh business for the nurse-bees, who run about from one cell to another, as if to see what these little worms want, and to wait on, and supply them.

For about ten or twelve days, the nurse-bees feed these worms or grubs with a substance called bee-bread, which is made soft like a kind of jelly. The worm being now full grown, its nurses close up the door of its cell with wax. It then winds itself up in a silken web, like a caterpillar, and remains in a chrysalis state for about ten days, when it opens its prison door, and comes out a perfect bee.

Another egg is soon laid in the same cell, and the same process, with a similar care of the nurse-bees, goes on till another brood of bees is produced. As soon as the young bees can fly, they join with the old ones in the various labours of the hive.

During the time of building the combs, as well as after, while some of the bees are busy in making wax and forming cells, others fly away to the fields, gardens, and woods, in search of pollen to be used as food for the worms, and to collect a kind of gum for varnishing the cells, and stopping up holes and cracks.

The working bees have a hollow place, like a kind of basket, in each of their hind-legs; and in these baskets

---

enough; alley; hatched; rolled; business; nurses; silken; caterpillar; chrysalis; define it. Spell process; brood; produced; various building; wonderful; instinct; define it. Spell implanted; building busy; fields; search; pollen; varnishing. What is pollen? Spel.

they carry what they collect. The pollen is the yellow dust found in flowers, and it is worked up into bee-bread. The gummy matter is procured from poplar trees and other sources.

The honey is made of a sweet juice that is sucked out of flowers, and swallowed into the honey-bags of the working bees. After filling their honey-bags, the bees roll themselves round in the flowers, and the pollen or yellow dust sticks to them. With a little brush on each leg, they brush this dust into their baskets, and pack it there; then fly away home.

When a bee thus loaded arrives at the hive, others gather round her to help off with her load, and the honey is poured into the combs that are ready for it. In gathering honey and bee-bread, it is found that each working bee goes out several times in the course of a day; and it is remarkable that before a shower of rain comes, they hurry home to the hive in great numbers.

Another curious circumstance is noticed, while building their combs. When any of the labourers are hungry, there are waiters ready to supply their wants. The hungry bee stops working, lowers her trunk to show that she wants something to eat, and a waiter forthwith gives her a little honey or bee-bread; after which the labourer goes on with her work.

Another office is observed among bees in very warm weather; and that is fanning, or making a wind to cool the hive and the workers. For this purpose, about twenty bees may be seen in a row, near the entrance of the hive, moving their wings with a rapid motion, as if to raise a current of air. It is even said that they take this office by turns.

It should be stated, that the cells for raising the young bees are not all made of one size. Those cells in which the

---

yellow; honey; juice; swallowed; roll; themselves; loaded; poured gathering; remarkable; curious; circumstance; noticed; labourers waiters; forthwith; observed; warm; weather; entrance; rapid; cells;

eggs that are to produce workers are deposited, are not so large as those built for the drones. The royal cells are also larger, and of a different shape from the others.

After the time of raising young bees is over for the season, and no more new combs are wanted, the wax makers, instead of keeping the honey in their bags to form more wax, empty it into the cells. When these are filled with honey, they are sealed over with wax, and kept for their food in the winter.

The drones are thought to be the males; and as they do not appear to work, they are put out of the way before winter comes, so as to leave the honey for those who have laboured for it.

---

When the eggs deposited in the royal cells are hatched into worms, they are fed with a different kind of bee-bread from the others; and they come out queens. But as it will not do to have more than one queen in a hive, it is found that when a young queen is about to come out of her cell, the old one gathers together a large number of workers, and with them leaves the hive. This is called *swarming;* and such a colony is said sometimes to contain near forty thousand bees.

When a swarm thus leaves the hive, they fly about in the air for some time, and then alight with their queen on some bush, or branch of a tree. In this state, they may be shaken into a hive, and if satisfied with it, they will go on with all the operations of a new family. But if they do not like their new hive, they will leave it in a few days, and swarm again.

It sometimes happens, that when a swarm leaves the old hive, it flies about in the air a short time; and then, instead of lighting on a tree, it takes a straight course, sometimes for

**office; deposited; built; different; instead; empty; probable; social; language; convey; intelligence; define it. Spell deposited; define it. Spell together; swarming; colony; leaves; satisfied; operations sometimes; leaves; lighting; straight; course; hollow; scarcely**

several miles, and enters a hollow tree in the woods, or some other shelter for a new home. This flight is often so rapid that a horse could scarcely keep up with them.

It is obvious that some one or more of the bees composing the swarm, must have found this retreat before the day of swarming, and knew exactly in what direction to lead the company, so as to reach it by the nearest route. Having a queen with them, they go on with their work, as if in a hive, as before described.

It is very probable, that all social animals have some kind of language by which they convey intelligence one to another. It appears to be so with a community of bees.

We have mentioned the attachment which they manifest toward their queen. If by any means she should be lost or die, those who first discover it inform the rest, and in a few minutes the whole hive will appear to be in confusion, and all work at an end.

This state of agitation sometimes lasts several hours. But if they find their queen, or she is by any means restored to them, they all become quiet, flock around her with apparent joy, and resume their work as before. If they should find the queen dead, and there should be no eggs or grubs in the cells to supply her place, they refuse to eat, appear to pine away with grief, and die in a few days.

If, however, there should be grubs in the royal cells, or, if found in any of the other cells, they would remove them to the royal cells, and carefully feed them with the kind of food that is given only to the queen grubs. As soon as one of these grubs is ready to come out, she becomes their queen; and harmony, industry, and content are at once restored in the hive. Such appears to be the wonderful

---

obvious; composing; retreat; knew; exactly; direction; described route; social; language; intelligence; community; mentioned attachment; define it. Spell manifest, and define it. Spell confusion whole; agitation; define it. Spell eggs; grief; restored; apparent knowledge and sagacity of these little creatures, in relation to the order and peace of the family.

Naturalists have stated, that a single queen bee will lay from sixty to seventy thousand eggs in one season. And a single hive will sometimes furnish three, four, and five swarms in one summer. Each of these swarms is supposed to contain thirty or forty thousand bees, and to have one queen with them. A good swarm sometimes weighs eight or ten pounds.

The times of swarming are often twice in a season; that is, in the first and last summer months. The time of day is most commonly between ten o'clock and two, when the weather is warm and fair. Of latter years, large houses or hives have been made for bees, so as to prevent them from swarming.

It is believed that the working bees travel several miles in search of honey and food; yet they have an instinctive knowledge of their course home, so as seldom or never to be at a loss in returning to their hives. The blossoms of white clover and buckwheat are very grateful to them, for the honey they contain.

It was formerly the practice to suffocate the bees, in order to get their honey. But of latter time, great improvements have been made in the manner of keeping bees, and obtaining the honey without destroying their lives, or depriving them of a sufficient portion of it for their subsistence during the winter.

If a glass jar, or other vessel, be turned bottom upward, over a hole made in the top of a bee-hive, and covered so as to make it dark, the bees will fill it with honey; and it

---

quiet; however; royal; carefully; industry; knowledge; sagacity; creatures; relation; naturalists; define it. Spell furnish; swarming; between; weather; believed; travel; search; instinctive; course; knowledge; blossoms; buckwheat; grateful; suffocate; define it. Spell improvements; obtaining; sufficient; subsistence; bountiful may be taken off, by passing a wire under it, and set on the table for use, exhibiting a beautiful appearance.

In contemplating the natural history of bees, who can forbear to admire the wisdom and goodness of the bountiful Creator, who has endowed them with such intelligence and sagacity,—taught them order, industry, and economy, and fitted them for enjoying all the happiness of which they are capable!

The industry and economy of bees and ants have long been proverbial; as holding up a useful lesson to youth, and mankind in general, to incite them to lay up a good store of knowledge and virtue in early life. A mind well improved in youth will be a valuable treasure, and a source of happiness and comfort to those who arrive at old age.

## STEAM-ENGINE.

A CERTAIN writer, in speaking of the powers with which man is invested, says, "He plants his arrows in the back of the whale, the monster of the great deep, and holds him in durance by his cords, while his life-blood is poured out and mingled with the waters, until he submits in death his gigantic carcass to the disposal and use of man. He also directs the lightnings, and chains to his cars, to travel as upon the wings of the wind, an agent in nature whose power is equal to the rending of mountains."

This power is steam; and the steam-engine is among the wonderful inventions of modern times. It consists of a large hollow cylinder, or barrel, in which is placed a moveable piston, nearly like that of a forcing-pump.

---

contemplating; endowed; economy; proverbial; general; incite; define it. Spell knowledge; treasure; source; sagacity; define it. Spell happiness; enjoying; industry; bountiful.

SPELL engine; invested; define it. Spell durance; define it.

This cylinder is connected with a large boiler that contains water, to which a strong heat of a wood or coal fire is applied. The water being made to boil, is constantly passing off in steam; and this steam, entering the cylinder, forces up the piston, till it opens a valve which lets in cold water.

This small portion of cold water condenses the steam, which instantly loses its elastic force, and the piston falls down in the cylinder. But a fresh portion of steam from the boiler again raises the piston till it opens the valve; and again the cold water rushes in at the valve, and chills or condenses the steam, so that the piston falls again.

The piston being connected with a large horizontal beam, called the working-beam, this continued action moves it up and down. The other end of the working-beam being attached to a crank, changes the direction of the force, and turns the paddle-wheels that work in the water, and propel the steamboat.

Thus, steam, by its elastic power, is the force which moves the piston; the piston gives motion to the working-beam; the working-beam turns the crank, and the crank turns the wheels. These are the simple principles of steam-engines.

But a steam-engine may be so constructed that it will regulate its own motions. By machinery, it will furnish a continued and regular supply of water to the boiler; it will open and shut its valves, supply oil where there is friction, and even ring a bell to apprise its attendants when any thing gets out of order.

Thus, a steam-engine, though it possesses the power of

---

Spell carcass; lightnings; agent; inventions; cylinder; moveable; piston; define it. Spell applied; instantly; elastic: define it. Spell boiler; valve. What is a valve? Spell condenses; horizontal; define it. Spell continued; attached; direction; elastic; propel; principles; engines; constructed; define it. Spell machinery; friction; define it. Spell apprise; possesses· managed; operations·

hundreds of horses, or "equal to the rending of mountains," may yet be easily managed by one or two persons who understand its operations.

Steam-engines are applied to mills for grinding grain and making flour, and other purposes, and also to manufactories of various kinds, as well as to boats and vessels.

In propelling wheels on rail-roads, a steam-engine is placed on a carriage to which it gives motion, and is thence called a *locomotive.* This has a tender attached, that contains the engineer, or driver, and a supply of fuel and water. To this the cars for passengers, and baggage, and goods, are fastened; and, by the force of steam, they are all carried along at the rate of fifteen to twenty miles in an hour, with a rapidity "as upon the wings of the wind," that once would have been thought impossible.

By the use of steam-engines and rail-roads, travelling is facilitated; the oppression of stage horses, as formerly driven, is avoided or lessened; and if a proper degree of prudence and care were exercised, without too much haste, these improvements might be a benefit to the human family, for which gratitude should arise to Him who teacheth man knowledge and discretion.

---

manufactories; propelling; define it. Spell carriage; locomotive engineer; define it. Spell passengers; fastened; rapidity; impossible; facilitated; define it. Spell oppression; avoided; lessened exercised; gratitude; discretion.

## COUNSEL TO YOUTH.

To be good is the way to become happy; and the way to become good, is to keep the mind, the temper, and the conduct rightly regulated and governed every day.

In order to attain this, it is needful to be watchful over your thoughts, words, and actions. And the best way to gain a habit of constant watchfulness and care, is to remember your Creator in the days of your youth.

This is that "fear of the Lord" which is said in the Bible to be "the beginning of wisdom," and which teaches to hate and avoid evil. It is so to bear in mind that God is ever present,—the overseer of all your thoughts, words, and actions, as will induce you to avoid that which you know to be evil, and to say and do that which is good and right.

To begin every day in a proper manner, it will be found a good practice, as soon as you are awake in the morning, to turn your thoughts towards your heavenly Father; and endeavour to feel thankful to him for his care and protection over you, during the past night, while you were asleep.

This sense of gratitude and love towards God, for the blessings of preservation from harm, and the continuance of your health,—will lead you to feel sincere desires that he may preserve you from all things that are not right in his sight, during the ensuing day.

If you are sincere in these desires, you will feel a prayer arise in your heart that he may not only preserve you from all evil in thought, word and deed,—but also that he may assist you by his grace and good Spirit to fulfil all your duties, and so to live in his fear through the coming day, as to gain his favour and approbation.

This morning devotion, though it may be only in thought, will induce you to maintain a watchful care over your temper, your words, and your conduct through the day: so that when you bring yourselves to account, as in the presence of your Judge, the next evening, you may feel nothing to condemn you for doing wrong.

This fear of the Lord, and a watchful care in all things to try to please him, will induce you to be dutiful and kind to your parents, brothers and sisters; gentle, affable and obliging to all persons; and careful to give no just occasion of offence to any.

It will greatly tend to help you to govern your tempers so as not soon to be angry; and will keep you from giving way to strife, ill-will, envy and malice, as also from speaking evil of others.

You will see the beauty and propriety of always speaking the truth, on every occasion; and thus be preserved from ever telling a falsehood, even in jest;—as knowing that God is ever present to take account of all your words and ways; for which he will surely bring you into judgment.

When you are at school, you will see it right to be diligent at your studies; and endeavour to improve in every branch of learning that is assigned you. Let your conduct and behaviour at school, and in going to and returning therefrom, be such as becomes children who wish to stand approved by their parents and teachers, and also in the sight of their heavenly Father.

The fear and the love of God will teach you to feel love and good-will towards all people; and also a care not wantonly to torture, or abuse, or give pain to dumb animals. Mercy, gentleness and kindness are qualities that are well-pleasing to God and good men, and they lead to pity the helpless, the poor, and the afflicted, as well as to relieve their sufferings. Hence it is said, "Blessed are the merciful: for they shall obtain mercy."

The love of God and of one another will induce a due and proper attendance on divine worship; and a quiet, humble, and reverent conduct while there, so as not to interrupt or disturb the attention of others: nor will any lightness of behaviour be indulged, either in the meeting, or in going to or returning therefrom.

If at any time, through unwatchfulness or otherwise, you should commit a fault, or offend any person, be willing frankly and fully to confess and acknowledge it; and thus seek forgiveness, and make all the amends in your power.

At evening, when you retire to rest, reflect calmly and particularly before you close your eyes for sleep, how, and in what manner and disposition you have spent the preceding day. If on a careful review of your conduct, your words and your actions, as in the fear and presence of the Lord, you find any thing has been said or done by you that gives you pain or uneasiness of mind, endeavour by sorrow and repentance to seek forgiveness of your heavenly Father; and resolve, with the assistance of his grace, to do so no more.

But if, on close examination, you should find nothing has been said or done amiss by you, and that you have fulfilled your duties to the best of your knowledge and ability, so that you can feel innocence and peace of mind in the review of your conduct,—then let an humble acknowledgment, with gratitude and thankfulness, arise in your hearts to the great Preserver of men, for his goodness towards you in thus keeping you from evil. You may then resign yourselves calmly to sleep, in the hope of his continued protection and blessing.

It is said "Short settlements make long friends." If you thus adopt a habit in early life of maintaining a watchful care over your words and conduct, and every evening bring yourselves to account for the manner of spending the past day, you will be likely to become wise in heavenly wisdom, and the right improvement of your time; and will also gain the favour of Heaven, with a peaceful conscience.

In the days of youth, when going to school, or otherwise pursuing your studies, it is a good practice, every evening to look over the affairs and business of the day past, in order to see what you have learned;—what valuable knowledge you have gained; what advances you have made in your studies; and what improvement in life and conduct.

It is also sometimes useful to keep a diary, or common-place book; in which may be written such notes or memorandums of occurrences and events, of progress or defects, as may stimulate to more watchfulness and diligence, in rightly filling up the passing moments of life.

Thus in every place, and in all stages and conditions of life, the reflecting mind may improve; and every day people may grow wiser and better, by taking heed to their ways and endeavouring to live as well as they know how. By such a course of conscious rectitude, gratitude, and love to God,—when the period of life arrives, death will be no terror, for heaven is the hope of the righteous.

# APPENDIX.

## QUESTIONS FOR EXERCISE.

LESSON 1. How is the way to become happy? In what length of time does the earth turn round on its axis? Of what is glass made? How long does it take for the moon to go round the earth?

2. How many perches in an acre of ground? How many seconds make a minute? How many minutes in an hour? How far does sound fly in a second of time? How far is the moon from the earth?

3. What things are dangerous for children to play with? How far is the sun from the earth? What occasions an eclipse of the sun? When does it happen? What is the cause of an eclipse of the moon? When does it happen? What article is the greater part of people in the world clothed with? Why are barley and oats called spring-grain?

4. Who are our best friends? What forms the rainbow? How many colours in it? What are the colours of the rainbow? How many stars may be seen at a time? Why are some called fixed stars?

5. When are barley and oats sowed? How long before they are ready for harvest? Why are wheat and rye called winter-grain? What is mutton? veal? venison? beef?

6. What is a fluid? How much lighter than water is common air? What is a solid body? Is the earth a solid body? What is parchment made of? How is it made?

7. What is a globe? What is the middle of it called? What is the surface of any thing? Is the earth a globe? What other bodies? What is the diameter of a globe? Is the axis and diameter the same? How long is the diameter of the earth? What is the length of its circumference? Define circumference. How long is the earth in turning round on its axis?

8. What is twilight? How long is the earth in going round the sun? How far is the sun from us? How long is light in passing from the sun to the earth? How many miles do the rays of light fly in a minute?

9. What is a solar day? How many hours make a solar day? When does the solar day begin? and end? In almanacs, what part of a day is called morning? and which hours, evening? What is the

definition of metals? What are ores? What is a mine? What is a century? In what century are we now? In what century were clocks and watches invented?

10. What is a wigwam? Of what is it made? How do pine-apples grow? Why are they called pine-apples? Where are they cultivated? What is a factory? A manufactory? How long since printing was invented? Were there no books before printing was invented? How were they made?

11. What is a magnet, or loadstone? Where found? How many species of insects do naturalists reckon? What is gum Arabic? Where does it come from? How many people in Asia live upon rice? In what other part of the world do people live on rice. Name the four quarters of the world. Of what is the nervous system composed? What is a library?

12. How far does light fly in a second of time? What is the science called optics? What is thunder? What is the reason of its long rumbling? When is lightning very near? When farther off? Which are carniverous animals? How do they seize their prey? Of what is the windpipe composed?

13. What are the solid joys of mankind? Are knowledge and wisdom the same?

14. What occurs with insects on a warm summer evening? On what do bats feed? How do they catch them?

15. In cities, what are houses built of? Of what, in villages and country places? What is scantling? What is a cabin? With what are they covered? What is a thermometer? With what is the bulb filled? Does it expand with heat? What follows? Does it contract with cold? What follows? What is the use of the scale of degrees?

16. How do the Indians bring up their children? What is Mason and Dixon's line? Why so called? Where situated? In what year was it settled?

17. What is the character of a candid person? What is placed in the human mind, to show us what is good and right?

Page 28. What is a mirror? How many kinds of mirrors are there? What are they called? What is a plane mirror? What is the silvering of looking-glasses made of? What is tinfoil? How are the tinfoil and quicksilver fastened on the glass? What is a convex mirror? What a concave?

29. What about fishes? What is the use of their gills? On what do fishes feed? What is the use of their fins and tails? What about the eyes of fishes? What are their eggs called? How many eggs has a cod fish? How many a mackerel? Do all these produce fishes? What becomes of them?

30. For what is the pine-tree valuable? What are tides? To what are they attributed? How often do they flow? What causes the rainbow? What is a field cricket? How does it make a noise?

31. What is a fluid? Why is water a fluid? Is air a fluid?

39. Where is rock-salt obtained? How deep are the salt mines of Cracow? What is a shaft? How is the salt raised to the surface of the ground? Do people live in these mines? Is the ocean salt water? How is salt obtained from sea-water, or salt-springs? How is fine salt made?

40—41. What is a potter? Where is the clay obtained, of which earthen-ware is made? Are bricks made of the same kind of clay? Why do bricks and earthen-ware become red in burning? How is the clay prepared for making earthen-ware? How are the vessels formed? What is the next process? How are they glazed? Of what is white-ware made? Stone-ware? How is stone-ware glazed? What is porcelain? Of what is it made? How are these prepared? How are handles, spouts, &c., formed? How long are the articles exposed to a red heat in the kiln? Of what is the glazing made?

44. What are amphibious animals? Name some of them. Whence comes the common frog or toad? How long before the egg becomes a tadpole? How long before its hind feet appear? and its fore feet? What becomes of its tail? When it becomes a frog, what does it live on? How does it catch them? Do frogs breathe? Where are they during winter? Are toads hurtful? or useful? What do they live on? What are lizards? What is a land tortoise? On what does it live? Are there other tortoises? Of what kind of tortoise-shell are combs made?

47. Who is a farmer? What produce is raised by farmers? How is the ground prepared for the seed? What is called broad-cast sowing? How are the plants dressed, or kept from weeds, &c.? How are wheat, rye, oats, &c., gathered? How Indian corn? How is grass made into hay? How is rice raised? What is barley used for? Oats? How is sugar-cane cultivated? How is sugar made? How purified? How is loaf sugar made? How is maple sugar made? Where is it manufactured?

50. What are spices? Where do nutmegs grow? On what kind of tree? What is mace? In what islands are nutmegs raised? What are cloves? From whence are they procured? What is pepper? On what does it grow? How are they dried fit for use? Where do they come from? What is cinnamon? How is it obtained? and where from? What is allspice? Why is it called allspice? Where does it grow? What is ginger? How are the roots prepared? Where cultivated? Whence is Cayenne pepper brought! Which is stronger, Cayenne, or red pepper?

52. How many bones are there in a human body? How many muscles? What are they composed of? What are tendons, or sinews? What are the uses of the muscles? What hinders insects from getting into our ears? What kind of feelings should we entertain towards our Creator for this kind provision for our safety? Why does a wound bleed? What is meant by the circulation of the blood? By what channels is the blood sent out from the heart to every part

of the body? By what means is it returned to the heart again? How often does the blood circulate in a healthy person? What supplies fresh blood to the body?

54. What are metals? When metals are first dug out of the earth, what are they called? What is a mine? From whence is gold obtained? Define gold. What is it used for? What is silver? Where found? In a pure state? or mixed with what? What is the ductility of silver? What are its common uses? Where is copper found? What are its uses? What is brass made of? In what proportions? What are its uses? What is tin? Where found? What depth are the Cornwall tin mines? What is tin-ware made of? Of what is bell-metal composed? What is tinfoil? What is pewter? Of what is it composed? What is zinc? and its use? What is lead? What is a shot factory? How is shot made? What is white lead? How is litharge made? What is red lead? and how made? What is the substance commonly called black lead? What other name has it? What is platina? Describe its properties? Which is the most useful metal? Where is iron found? What is bog ore? Mountain ore? How is the ore reduced to iron, fit for use? Describe a furnace. How is a furnace used for blasting? How is the iron ore melted? In what state is it called pig-iron? How is pig-iron brought to a state to be worked on the anvil? What is a tilt-hammer? How is the iron made into bars or sheet-iron? How is iron converted into steel? What is blistered steel? cast steel? In what does the blacksmith work? What is cutlery?

62. Why were the early settlers of Pennsylvania called colonists? What kinds of buildings or shelter did the first settlers erect? What became of the Indians? How did they live among the white people? What ancient custom had the Indians, of the free use of one another's wigwams and food? Did they continue these customs with the white people? Were they kind to the settlers?

64. What is natural history? What is embraced by natural history? Are children capable of studying natural history? How is natural history divided? What is zoology? botany? mineralogy? geology?

65. Is a bat a bird, or a quadruped? What is its size? How does it fly? On what does it feed? How does it live in winter? Is it hurtful or injurious?

66. Describe flax. What are the seeds of flax called? Of what use is linseed oil? When is flax ripe for gathering? How is it gathered? How is it rotted? What is a flax-brake? What is a hackle? Of what use is tow? How is flax spun? What is it used for?

68. What is cotton? How are the cotton plants raised? How are the seeds separated from the cotton? How is cotton packed in bales? Where is cotton raised? Describe the hemp plant. How is the hemp bark prepared for use? What articles are made of hemp? What is oakum? and for what use? Where is hemp principally raised? And where else?

70. What is camphor? Its qualities? Where does the camphor tree grow? How is the camphor obtained? What is gamboge? Of what colour? What is its use? Whence is it imported? What is gum Arabic? Where found? What is opium; whence is it obtained? and how? How is opium converted into liquid laudanum? Of what use is laudanum and morphia? Where is opium cultivated?

73, &c. What is a prism-glass? What is the effect of looking through a prism-glass? How many different coloured rays does light consist of? Name the first; second; third; fourth, and the other three. What constitutes white? How may this be proved? What are colours? Of what colours is green composed? What colours make orange? violet? purple? olive? What makes black? What is the cause of colours? What produces the sense of seeing? What occurs where there is no light?

75. Who loves truth better than falsehood? What is a fiction? What is a novel? Who wrote a book against lying? What does she say constitutes lying? What else? What does a person gain by telling falsehoods? Is it honest to depart from the truth? Is it mean and wicked to tell a lie, to hide a fault? What course is better and more noble? What does the Scripture say about lying?

76. What is sculpture? Who is a sculptor? What is a statue? What is a bust? Of what is a bust made? What is the meaning of bas-relief? Give some examples of figures in bas-relief? How are casts or busts made? What is bronze? What is a medal?

77. Which are called ruminating animals? What is the definition of ruminating? What is the general character of ruminating animals? On what do they feed? Describe the faculty of chewing the cud. What kind of animals are ruminating? Where are they found?

78. What are hats made of? How is a wool or fur hat made? What is meant by felt? bowing? What is a batt? What is planking a hat? How is a hat brought to its proper shape? How are hats dyed? How stiffened? and with what? How is the nap or fur raised on the outside? Are white hats dyed? Of what other materials are hats made? How are hats made of straw? Of what are caps made?

80. What about deer? What means of safety from enemies have they? Describe a deer? What colour? What disposition? What about its power of smelling? Its teeth? Is it a ruminating animal? On what do deer feed in summer? In winter? Do they feed in flocks, or alone? What occurs, when they are alarmed? What is the male called? the female? Do the bucks shed their horns? What follows? What are antlers? What are the young ones called? What is their colour? Does it change? and when? Can fawns be tamed? What is the flesh of deer called? Is it good? What are the horns used for? and the skins? Where do the deer inhabit? What other animals are considered species of the American deer? Who can repeat the poetic address to a wild deer, supposed to have left the woods, and come amongst men?

85. What is gratitude? Whence are all our benefits derived? Is gratitude a pleasurable duty? What was the exclamation of David, when under a sense of the obligations of gratitude to the Supreme Giver? How can we manifest our gratitude?

86, &c. What is an amphibious animal? What is the thickness of a single thread of silk as it comes from the silk-worm? What of a single cord of spider's web? What are raisins? Where do they come from? What is the orbit of a planet? What animals have no teeth in the upper jaw? Define the science called optics. In what places is carbonic acid gas sometimes found? How may it be known, when it is in wells? If a candle will not burn therein, is it safe to go down a well? How is spirits of turpentine produced? How long is the scent of musk said to remain in a room? What is the whole duty of man, as stated in the Bible? Of how many layers is the skin composed? What is sight defined to be? What is the colour produced by mixing a single grain of blue vitriol with a quantity of water?

88. What should be the first care of a person, when speaking or reading to others? What rule is useful, in order to be heard? Why so? In common conversation, why do some people speak so low as not to be understood? Should writing also be plain and distinct? Why? What are the disadvantages of a careless manner of writing and signing names? What anecdotes go to show this?

90. What is glass made of? How? What is meant by blowing? How is it performed? How are common glass bottles, or vials, made? How goblets? How is window-glass made? How cut into panes of proper size? How are large plates for mirrors made? By what process are they polished, or made smooth and even? What is the ductility of glass? What is annealing glass? How is it performed? What its use? What is cut glass? How made? How is glass coloured? and with what?

92. What is geography? Who is called a geographer? What is a map? What part of a map represents the north? which, the south? which, the east? the west? How are rivers and streams of water represented on maps? What are the names of the four great divisions or quarters of the globe? How are they divided? How is the land divided? What is a continent? How is an island defined? What is a cape? a peninsula? an isthmus? How are the waters divided? What is an ocean? a sea? a lake? a bay? a river?

94. What is a dialogue? Who are the two that can repeat the dialogue between a mother and child?

95. What does Solomon say about friends? What may be said about good neighbours? What will promote harmony and peace between neighbours? When we borrow any thing, what should be done? If an injury happens to a borrowed article, what should be done? What kind of care or precautions are needful, in order to have good and kind neighbours?

96. Describe the indigo plant? How is it raised? How long is it

in growing to maturity, ready for cutting? What is then done with it, to obtain the indigo? What is the use of indigo? Where is indigo raised and manufactured? Whence imported? What is cochineal? How are cochineal insects obtained, and prepared for dye-stuff? What colours are dyed with them? Where is cochineal found? What is madder? What colour is dyed with it? Where does it grow?

What is the density of the atmosphere near the earth? What is the cause of it? Does any object appear larger through a dense medium than a rare or thin one? But we see the sun rise through the densest part of the atmosphere, near the horizon, is this the reason why it appears larger, than when seen at noon? Can this be illustrated? How? Is water, then, denser than air? Relate the anecdote of the Indian.

99. Where was William Penn born? In what year? How long is it since? How old was William Penn, when sent to college? For what business was he to be educated? At what age did he join the Friends' society? How long before he became a preacher? Did he suffer persecution for his religion? When cast into prison, how did he employ himself there? What excellent book did he write? When did he petition the king of England for the grant of Pennsylvania? When was his request granted? What followed, in relation to the right of the Indians? What gained for William Penn the entire confidence and esteem of the natives? What induced the people from England to cross the Atlantic, and settle in this then wilderness country? Did the Indians assist the new settlers? How? In the laws made by William Penn, what was his great and special object? What was the character of William Penn? What was the great rule of his life? In what did his greatness consist? His death, when? His age?

101. Of what are pins made? How is wire made? What is the first process of making pins? the next? the next? How are the points of pins sharpened? How many are said to be pointed in an hour, by one boy? What is to be done next? How are the pin-heads made? How are they put on and fastened? What is the process of whitening the pins? How are they polished? What is the last operation? By whom is the labour mostly performed?

104. What answer did the little boy make to the question, Why everybody loved him? Are we more happy, when we love everybody,—or when we are angry and dislike others? What is the fruit of love? Do wrath and hatred make people happy? What is the source of anger, hatred, envy, and contention? Are all these bad passions wicked, when indulged? Whence proceed quarrels, disputes, and wars? To a person who loves to feel love and good will to all others, what does the sight of soldiers and military parades produce? Why? Is war contrary to the precepts and spirit of Christ? What are some of the evils of war? and to what does it tend? What the effects of peace? Which is most to be desired by a humane and feeling mind? Are tales, pictures, and histories of wars, bloodshed,

violence, and cruelty, proper to be put into the hands of children to read? Why? What should be our Christian feelings when we read, or hear of wars, quarrels, and fightings?

107. Describe the descent into a copper mine, in England? What depth was it? What were the miners employed about? How did they see in such a deep mine? How is the copper situated? and how obtained? how got out of the mine? What is the difference between this mine, and some coal mines under hills or mountains?

110. Is a seal an amphibious animal? What is amphibious? Where do seals live? What is their food? How do they catch their prey? Describe a seal? How large is a common seal? What is its covering? Where do they bring forth their young? How long do they remain on land? How long can seals remain under water? Do seals produce oil? Is the flesh used for food? Are their skins of use? And for what purposes? Do the natives make boats of seal skins? How many seal skins, and how much seal oil, have been known in one ship's cargo?

113. What is a balloon? and how constructed? How large is a balloon that is to carry a man up in the air? What kind of gas is used to fill balloons? Why? What causes the balloon to ascend? Is there any real use in balloons? Have not some men been killed by falling from balloons to the earth? Is not the surface of the earth the proper place for men?

119. Describe the eye-ball? What is the retina? What conveys the image of objects to the retina? What part of the eye is called the cornea? What the iris? Why? From what cause is the colour of the eyes denominated? What is the pupil of the eye? What animals have large pupils? For what purpose? When there is too much light, how are the pupils affected? Why can we not look at the sun? When we go out in a dark evening, why does it appear lighter, after we have been out a while? What are among the uses of the eye-brows and eye-lids? What are eye-lashes? Of what use are they? What further use are the eye-lids? What is the effect of nictation, or the frequent act of winking? What keeps the eye moist? How is this liquid spread over the ball of the eye? What are tears? whence do they proceed, and come into the eye? When we wink, what is the effect on the tear-glands? What becomes of the dust or particles that are thus washed off by winking? How conveyed into the nose? What occasions the tears to flow over, and run down the cheeks? If the nasal tubes, or tubes leading from the eyes to the nose become stopped, what may be the consequence?

121. What is the length of the earth's diameter? What is the axis of the earth? What is the north end of the axis called? what the south end? If the north end of the axis be supposed to extend to the skies, where would it strike? Is that the reason why the north star is called the pole-star? Define the line, called the equator. What is meant by the latitude of a place? How is latitude reckoned? Why? How far, then, are the poles from the equator, in degrees? Can the latitude of a place ever be more than ninety degrees? Why is lati-

tude sometimes north, and sometimes south? How many miles are in a degree of latitude? If Philadelphia is in 40 degrees of latitude, how far is it from the equator? What is longitude? How is it reckoned? In maps, where shall we look for the degrees of the latitude of places? Where are the degrees of longitude placed? On globes, how are meridian circles placed? Where are degrees of longitude found on globes? What is the horizon? Why is the length of the days different at different places? What is the earth's orbit? What the diameter of this orbit? Is the equator always in the plane or line of this orbit? How does it vary from it? What is the line or part of the earth called, that is always toward the sun? Why then does the place or point of the horizon where the sun rises, continually vary? Does the sun rise north of the equator (that is north of east) in the summer, and south of it in winter? for what reason? What are the equinoctial points of the equator? Why so called? When are the days longer than the nights? and when shorter? When the moon is near full, what part of the ecliptic is it in, in relation to the sun? Why does the moon rise south of east in summer, when full? Why north of east in winter?

124. What is botany? How many parts has a perfect plant? What are they called? What is the use of the *root?* Describe the *trunk* or *stem*, and tell its uses. What are the parts of the trunks of trees called? Describe the *leaves* of plants. Also the *supports.* Of what do the *flowers* consist? Name the seven parts of flowers. What is the calyx or cup? the corolla? of what colour? What are the stamens? and their anthers? what the farina? What is the pointal? What is its use or office? What is the germ or *seed vessel?* How is the seed formed? How are plants divided by botanists? Of what are classes composed? orders? genera? species?

126. What is a library? What is a private library? Describe a circulating library. What is a public library? How is money obtained for purchasing books? What is the person called who takes care of the library? Who purchases the books?

127. What is a paper-mill? How is the machinery set in motion? Of what materials is paper made, such as is used for writing or printing on? What is the first operation? By whom performed? What is the next process? For what purpose? What is next done? Describe the cutting machine, and its operation. How long does it take to work the rags into a pulp? How do they bleach the pulp? What is bleaching? How may the pulp be coloured? But how is the paper made of the pulp? Describe the paper-making machine. How is it turned round? How is the paper pressed? How dried? What is sizing? What is the use of the sizing? How are the sheets cut into proper size? How, and where are they dried? What is the process called, which puts a gloss on paper? How many sheets make a quire? How many quires make a ream? What other things, besides rags, are used for making paper?

130. What is a volcano? Name some of the most noted volcanoes. What is an eruption of a volcano? What is the crater of a volcano? Describe the size of the crater of Vesuvius. What kind of noises

were heard within it? What did they see in the bottom of the crater? How large was the fire? What appearance had it? The next morning, what did they see in the crater? What issued from one of the furnaces? How high did they ascend? What appearance had the other furnace? How long did the travellers stay to view this volcano? How far is Naples from this volcano? What effect had the thunders of the volcano at Naples? What is lava? How did the volcano appear at night? What idea may be formed of the terrific noises of a volcanic eruption? We would suppose people would be afraid to go near to a burning mountain; but did these travellers go up the side of Vesuvius? How far? What did they see? What was the effect of the stream of lava that ran down the side of the mountain? How large was the largest stream of lava? How high did the red-hot stones appear to fly above the crater? How long did this eruption continue? What other destructions have attended the eruptions of Vesuvius?

134. What is cork-wood? Where do the cork-trees grow? How old are they before the bark is taken off? Do the trees die when the bark is stripped off? How often may they be barked? What is the process of preparing the bark for market? How do the cork-cutters form this bark into corks, and other things?

What is gum-elastic? How is it obtained? What is it like? How formed into shoes, and other things? Why is it called India-rubber? What is meant by water-proof? To what other uses is gum-elastic applied?

What is a foundry? How is metal melted? Of what do they make patterns? How are molds made? How are stove-plates, bells, and other things cast?

136. Are hares and rabbits the same? wherein do they differ? Describe their general character and form. On what do they feed in summer? in winter? Of what use is their fur? their flesh? What animals make a prey of them? What is a leveret? How many did Cowper undertake to tame? What names did he give them? How did he manage them? What history did he give of Puss? his being sick, and getting well—taking him into the garden, &c.? What is his history of Tiney? his sickness, and getting well, &c.? What did he say of Bess? and of his death? Which did Cowper consider superior to the rest? What about the cat and Bess? What about the carpet and patch? and about the miller? How long did these hares live? What about the spaniel and Puss? What is a spaniel? Did they quarrel? Was Puss afraid of him? What was Cowper's conclusion about them? What were his views of hunting hares, and the diversions of sportsmen in pursuing them? Repeat his poetry about Puss.

142. In what countries do liquorice plants grow? How high? what kind of leaves? How is the liquorice obtained? What is liquorice stick? How is liquorice ball purified? What its use?

What is rhubarb? Where does it grow? What its colour? Its use? What is asafœtida? Whence obtained? What are its properties? taste? smell? uses?

How is manna obtained? From what kind of trees? What is it used for? Whence imported? What is myrrh? Where does it grow?

What are its qualities? Its use? What is gum-guaiacum? How procured? From what trees? Where do they grow? What is the smell of gum-guaiacum? its taste? its uses? What is tragacanth? whence obtained? What are its uses? Where do the plants grow? Whence imported?

144. Where is Baffin's Bay? Repeat the description of the Polar bear.

145. What is the first thing to be done, when a rail-road is to be made? What is grading? How is it done? What is the foundation for the rail-way? What is the track? describe how made. Of what are the wheels of the cars made? How fixed, so as to run easily? What is a locomotive? By what force is it moved? How far does it travel in an hour? What is meant by a train of cars?

146. What lesson of instruction or caution may be learned by reading the account of Franklin's whistle? Repeat the story of his getting money and buying the whistle. What followed? What did his brothers and sisters tell him about his bargain? What was the effect on Franklin's mind? Of what use to him was this event afterward? How did he apply it, when he wanted to buy something that he did not need? Repeat some of the other cases in which he applied the giving too much for the whistle.

148. Describe the moon. What length is its diameter? What is its size, compared with the earth on which we live? How far is the moon from the earth? Which way does it go round the earth? In how long time? What occasions an eclipse of the sun? When is the moon called *new-moon?* Does the moon give light of itself? What produces moon-light? Why does it appear as a narrow crooked streak, when the new-moon is first seen? Why does the full moon appear so round and light? What occasions an eclipse of the moon? For what reason? Is the same side of the moon always towards us? How long is a day and night to the lunarians, or people who live on the moon, if it is inhabited?

151. What is a receipt for money paid? What should be mentioned in a receipt? When is it proper to take a receipt? Should the amount of money paid be written in words, or in figures? What is meant by buying on credit? What should then be done? Is this book-keeping? When the account is settled, what should be done? If only a part is paid, how entered? What is an expense-book?

152. What is economy? What is frugality? Repeat the saying of a wise man, on frugality. What happened, when a poor man went to the house of a rich man to beg? Did he get any thing of the rich man? What followed? What said the rich man, when he explained his conduct? What is said of Stephen Girard's frugality? What of John Woolman's, in not wasting paper? What is meant by parsimony?

154. What is the comparison between the bright sun-beams, and a dutiful child? The fragrance of flowers, and a kind heart? The chickens, and obedient children? The garden, and the harmony of brothers and sisters?

155. A psalm of David, worth committing to memory, as showing the mercy and compassion of the Divine Being towards those that in humility cry unto him in their troubles, and turn from the evil of their ways.

158. Is he who is cruel to animals unfit for a friend? What will a humane person do, when he sees a snail in the public path? What animals may be killed? and where intruding? if necessary for our safety? Where are animals privileged, and should be left unhurt? Mercy is opposite to cruelty; repeat the last paragraph, on mercy.

159. What is the atmosphere? What is a gas? Of how many kinds of gas is atmospheric air composed? What are they called? Suppose the atmospheric air to be 100, how many parts are oxygen, and how many nitrogen? Which part of the air, or kind of gas, supports life, and causes the fire or a candle, to burn? What is said of nitrogen gas? How is hydrogen gas obtained? For what is it used? Where is carbonic acid gas found? Will it support life, or cause fire to burn? Will a candle burn in carbonic acid gas? Is it heavier, or lighter than common air? Is that the reason of its remaining in the lower part of wells and cellars? What should be done, before a person goes into a well or cellar, where there is carbonic acid gas? If the candle goes out, is it safe to go down? Does the burning of charcoal in a close room produce carbonic acid gas? What caution should be used in regard to sleeping in a room where coals are burning? What sometimes happens when these cautions are not attended to?

161. What is the effect of giving way to impatience or anger? Where are the virtues of an amiable temper best displayed? If disputes or offences should arise, what cautions are needful about writing to others? What are the evils resulting from writing letters, under angry or unkind feelings? If we value our own peace and quiet, what is best to be done, when occasions of anger, ill-will, or impatience occur? What will aid us in the practice of keeping calm and quiet? What was the maxim of king Solomon, in relation to this subject?

163. The questions contained may be answered by the reader, so far as they can be identified with practical subjects of knowledge.

165. What is a mule? Compare mules with horses. For what are mules used? What are the roads or paths which cross the Andes mountains called? Where are the Andes? Repeat the substance of the anecdote relating to the mule's falling down the steep of the mountain.

169. What is science? Of what does the science of astronomy treat? What is meant by the solar system? How many planets move round the sun? What are their names? What are the names of the four asteroids? How much larger is the sun than our earth? What is the length of the sun's diameter? Do the planets receive their light from the sun? What are planets? Which is nearest the sun? How far is Mercury from the sun? How long is it in going round the sun? How long in turning round on its axis? How far

is Venus from the sun? How long in turning on its axis? What time does Venus take to move round the sun in its orbit? What is an orbit? When is Venus called morning star? When, evening star? What is its diameter? Why does it appear larger than any of the other planets? How far is the earth from the sun? How long in going round in its orbit? At what rate every minute? and every hour? How many miles is the diameter of the earth? its circumference? How long in turning round on its axis? Which is the next planet to the earth? How far is Mars from the sun? How long in going round the sun? How long in turning on its own axis? What length is the diameter of Mars? At what rate does it move in its orbit? What is the appearance of Mars? In what part of the solar system are the asteroids? Are they visible to the naked eye? What is the size of Jupiter? How far is Jupiter from the sun? How many moons has Jupiter? Whence do Jupiter and its moons receive light? How long is Jupiter in going round the sun in its orbit? How long is Jupiter's year? How long in turning on its axis? Is that the length of its day? What is the distance of Saturn from the sun? How long is Saturn in going round in its orbit? How long is its year? What is the diameter of this planet? How many moons revolve round Saturn? What about its rings? Do they revolve round it? Which way? In what time? How long is Saturn in turning on its axis?

What is the distance of Herschel from the sun? How long is its year, or the time it takes to go round the sun? How many moons has Herschel? Is it known how long this planet is in turning round on its axis?

Where are the orbits of the four asteroids? What are the planets and moons supposed to be? Are they supposed to be inhabited?

177. What is a telescope? Of what is it made? What is its use? Describe a lens. What is a simple convex lens? What is a double convex lens? a plane concave? Are spectacle glasses lens? How many kinds of telescopes are there? What are they called? How is a common spy-glass, or refracting telescope, made? What is a reflecting telescope made of? Which kind of telescope did Dr. Herschel use? How were the rings of Saturn discovered? What else has been found out by means of the telescope? What about the moon? the sun? the stars?

178. What is a microscope? How many kinds of microscopes are there? What are they called? Describe a single microscope. What is its use? How is a compound microscope formed? What are its uses? What is a solar microscope? How composed? How used? Which kind enlarges objects the most?

180. What happens to insects, before they attain a state of perfection? Where do caterpillars come from? How many feet have they? How often do they cast their skins? What occurs previously? When full grown, what occurs? What of silk worms? How do others prepare for their chrysalis state? How long do they remain in this state? Do they eat while in this state? How do they come out of their cocoons? and what are they then? How many legs has a

butterfly? How many wings? What is its proboscis? for what use? How many eyes has a butterfly? How long do butterflies live? Do they lay eggs? What becomes of them?

183. What is natural history? What is a bee-hive? How made? In a swarm of bees, how many kinds are there? Name them. Describe the queen bee. How do the other bees act towards her? What are honeycombs made of? How do the bees obtain wax? What follows? How are the combs formed? Do the same bees finish the combs? Of what form are the cells? When the first comb is finished, what next? When the cells are ready, what does the queen do? How long before her eggs hatch into worms? What follows? What are the worms fed with? How long are the worms in growing to full size? What is then done? What becomes of the worms? How long does it remain in a chrysalis state? What then becomes of it? What becomes of its cell? While some of the bees are making cells and combs, what are the rest about? How do the working bees carry the pollen and gum? What is pollen? For what do they use it? What is the honey? How do they carry it? What occurs when a loaded bee returns to the hive? Do the bees go out to gather honey, &c., more than once a day? What do they do, when a shower of rain is approaching? When the workers are hungry, what is done? What other office is found among bees? How do they fan one another? Are all the cells made of one size? What is the difference? When the cells or combs are filled with honey, what keeps it from running out? What becomes of the drones? How are new queens raised? When a young queen comes out of her royal cell, what becomes of the old one? Is that what is meant by bees swarming? How many are supposed to be in a swarm? What becomes of them after they leave the hive? What sometimes happens when a swarm comes out, and does not light? How do they know where to go? When a queen bee is lost, or dies, what follows in the hive? But, if she is found, what then? If she should be dead, what follows? If there should be worms in the royal cells, what is done to supply the place of the dead queen? How many eggs does one queen lay in a season? How many swarms come out of one hive? and how many bees to a swarm? What is the weight of a swarm? What time of the year do bees commonly swarm? What time of the day? How far do bees travel in search of honey? Are the bees destroyed in order to get the honey? How may honey be obtained in a glass jar, without killing the bees? In contemplating the economy and order of bees, what should be our emotions? What lessons may we learn from them?

190. How is a steam engine constructed? What is a piston? What forces the piston up the tube? Why does it fall again? With what is the piston connected? What is attached to the other end of the working beam? What does the crank do? and what do the paddle wheels do? Now tell what is the moving force, and how it acts. What also may be done by machinery attached to this power? Does it take a great many men to manage a steam engine? To what else beside boats is it applied? What is a locomotive? What does the tender contain? How fast do they travel on rail-roads?

## PROMISCUOUS QUESTIONS.

Why is a frog called an amphibious animal?
How long is it since the art of printing was invented?
Describe the indigo plant, and tell how it is raised and where.
Of all the metals, which is considered the most useful?
How is salt obtained from the ocean, or from salt-springs?
What is the difference between the diameter of a globe, and its axis.
How much lighter is common air than water?
How may it be known when there is carbonic acid in a well?
Of how many parts do the flowers of plants consist?
What is the orbit of the earth, and the length of its diameter?
Of what metals is pewter composed?
Where is gum elastic found? and how is it obtained?
What is the difference between economy and frugality?
In what length of time does the moon go round the earth?
In making glass, what is the process of annealing it?
What is cochineal? and where does it come from?
How long is it since William Penn obtained the grant of Pennsylvania?
From what part of the world are nutmegs imported?
Of what materials is glass made?
In an acre of ground, how many square perches?
What is the substance of the story of Franklin's whistle?
How many planets are reckoned to belong to the solar system?
What is to be understood by blowing glass?
We read of Mason and Dixon's line, where is it? and why so called?
How is opium obtained, and where from?
Can any one tell the process by which wire is made?
Of what substance is parchment made? and how?
What mixture of colours form green? orange? purple? olive?
Who can describe the process of making pins?
What is gum Arabic? and where does it come from?
When we borrow any thing of a neighbour, what should be done?
What is the difference between a factory and a manufactory?
How many colours are there in the rainbow? and what are they?
How long a line would it take to reach round the earth?
What is gratitude? What is the substance of morality and religion
Of what metals is brass composed? and in what proportion!
Where is indigo raised and manufactured?
What is the root and source of all real happiness?
How is cotton raised, and where?
Why does the sun appear larger at rising than at noon?
Which is the nearest planet to the sun?
How long is it since the invention of clocks or watches?
Through how many states or changes do insects pass?
Of what is porcelain made? and how?
How is rice raised? and how many people live on it?
How far is it from the sun to the planet Jupiter?
What is a microscope? and of what use is it?
When the sun is eclipsed what is the cause of it?
There is a paint called white lead, of what is it made, and how?
What is the general character of the story of Joseph and his brothers?
What is a shot tower? and how is shot made?

How long does it take light to pass from the sun to the earth?
What is the reason that people wink? and of what use is it?
What is the cause of thunder? and why does it rumble so long?
If a boy cuts his finger, why does it bleed?
How far is the moon from the earth?
How often does the blood pass through the heart of a healthy person?
What is meant by natural history?
How many bones and muscles are there in a human body?
What is a tunnel? and how does it differ from a shaft?
For what reason did William Penn prefer a country life?
What is meant by the latitude of a city or place?
Is war consistent with the Christian spirit of love and good will?
By what means were the rings of Saturn discovered?
Give a definition of an Indian wigwam?
What is the principal material of which tin-ware is formed?
How is loaf sugar made?
What are the male, female, and young of deer, called?
How is the nap or fur raised on the outside of a hat?
What is meant by the science of optics?
When a person reads or speaks too low, what is the way to improve it?
Of what is the silvering on the back of looking-glasses made?
What are the principal productions of sculpture?
For what purposes is the pine tree valuable?
Do pine-apples grow on pine trees? how then?
What kinds of animals are called carniverous?
How long after the egg is laid, before a perfect bee comes out?
Where does the metal called tin come from?
How, and of what is earthen-ware made?
How far does sound fly in a second of time?
What is meant by the ductility of metals?
Raisins are dried grapes; from what countries imported?
What must a person do to have good neighbours?
How does pepper grow, and in what countries?
In what way is iron ore prepared for blacksmiths to use?
Of what is the nervous system composed?
Describe a prism-glass, and tell what occurs on looking through it?
What is gamboge? and whence imported?
What does Amelia Opie say constitutes lying?
How long is Saturn in going round the sun?
What is meant by the word *horizon?*
What is the reason that a balloon rises up in the air?
Why can cats and some other animals see in the dark?
How are plants divided by botanists?
Why did Girard stop to pick up a nail in the street?
How is steel made out of iron?
What is a thermometer?
How deep in the earth are the salt mines of Cracow?
Describe a furnace for blasting iron.
Of what materials is the sizing of paper made?
In what did the true greatness of William Penn consist?

THE END.

THE NEW YORK PUBLIC LIBRARY
REFERENCE DEPARTMENT

his book is under no circumstances to be
taken from the Building

410